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Journal of Electricity

Devoted to the Economic Production and Commercial Application of Electricity
IN THE ELEVEN WESTERN STATES

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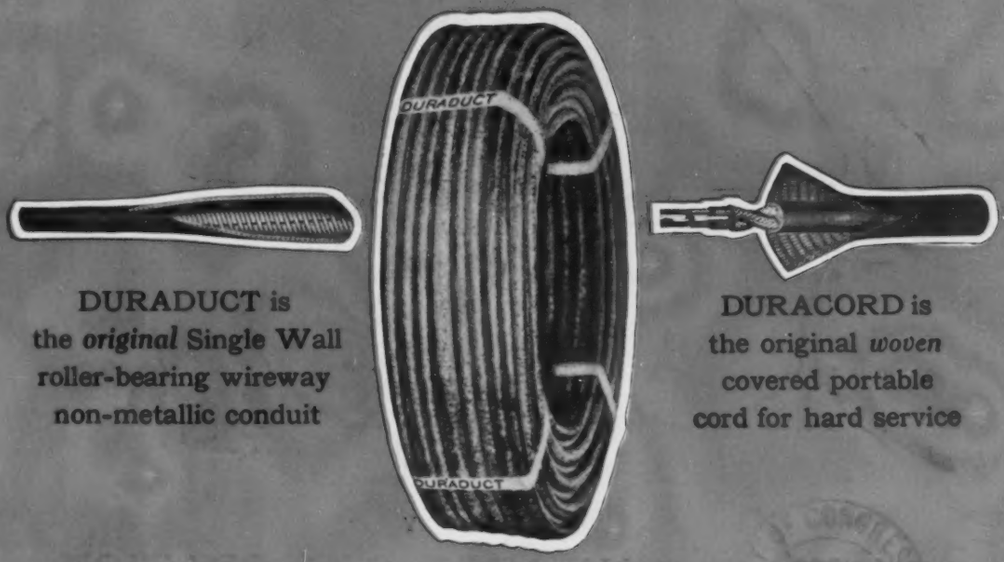

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IN THE ELEVEN WESTERN STATES

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C. T. HUTCHINSON, Editorial Director
G. C. TENNEY, Managing Editor

J. W. OTTERSON, Associate Editor
G. R. HENNINGER, Associate Editor

R. N. PHELAN, Associate Editor
B. H. SNOW, Northwest Editor

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WITH its background of fifty years of close association with industry, the McGraw-Hill Company is presenting the principles of efficient selling through a series of advertisements which are being run in some of the country's principal newspapers. The attention of our readers is called to the fourth advertisement of this series which is reproduced on pages 32-33 of the advertising section of this issue.

To manufacturers and salesmen who are selling industry the chief value of the story told in this advertisement is that it gives expressions in black and white to facts which they have known for a long time. Obviously, knowledge of a customer's business and of the service of product which is being offered for sale in his plant is becoming more and more needed for effective sales work. However, the point which we wish to emphasize in this advertisement is the concise statement of the four principles of industrial marketing. These are:

1. Market Determination
   Markets should be analyzed, worth while prospects located and effort concentrated upon them.
2. Buying Habits
   The buying habits of industry are definitely known. Sales and advertising plans should take these buying habits into account.
3. Channels of Approach
   There are direct means of reaching the industrial buyer which can be used effectively and economically.
4. Appeals that Influence
   The industrial buyer is influenced by certain known appeals. He should be approached through these appeals.

In an effort to lower distribution costs the McGraw-Hill Company has made an extensive study of the buying habits of industry. The results of this study have been published in a booklet, "Industrial Marketing," a copy of which will be sent upon request to anyone whose markets embrace the industries covered by the McGraw-Hill publications.

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EDITORIAL

Standardization Keynote of Lamp Simplification Program

STANDARDIZATION as advocated by Secretary Hoover and the Department of Commerce has been adopted by the lamp manufacturers. In the Mazda lamp simplification program just announced a new lamp with but one finish will replace all of the various sizes, styles and finishes of bulbs used for general lighting (10-100 watts inclusive). In connection with this program of simplification and standardization it might be well to review the progress which has been made by the industry in the past few years. In 1909 three tungsten filament lamps were listed for general lighting. Today there are 22. On the majority of these there are demands for fifteen different finishes. In addition these various types with their different finishes must be manufactured for different voltages. Last year alone manufacturers received requests for 3,000 different types of lamps.

It is to relieve this complex manufacturing and merchandising problem that the simplification program has been announced. The important features of the new program are: all bulbs will be uniform in shape and finish; all bulbs will have an inside frosting; the outside surface will be smooth; no distinction will be made between gas-filled and vacuum lamps; the new lamp will be more efficient.

The actual economic value of the program will be enjoyed by the manufacturer, merchandiser and the consumer. From the standpoint of the manufacturer costs will be reduced as soon as the program becomes operative. Stocks will be reduced as there will be no necessity to carry different types and finishes. Service and quality will be improved. From the standpoint of the distributor and merchandise stocks will be reduced and there will be a more rapid turnover. A better service will be available to the consumer because stock will be better balanced. Time will be conserved in handling sales as the purchaser will not be required to choose from a number of styles and finishes. Profits will be greater due to all of the foregoing factors. The consumer will have less confusion in purchasing lamps. He will get a more efficient product and therefore will receive a greater value for money expended during operation. The new lamps will cost less.

On the whole it is apparent that the industry as a whole and the public at large will benefit greatly through the successful execution of the lamp simplification program.

Lake Britton—a Memorial to a Great Leader

PECULIARLY fitting were those portions of the dedicatory exercises of the Pit No. 3 plant of the Pacific Gas and Electric Company that were devoted to the revered memory of a man the very mention of whose name arouses in the heart of every California electrical man a picture of love, friendship and leadership. And so that the name of John A. Britton will forever be remembered, officers of the Pacific Gas and Electric Company have placed his name upon one of the important units of the Pit River development. The storage reservoir above Pit No. 3 plant, a beautiful lake stretching nine miles upstream from the masonry dam, has been named Lake Britton. It is fitting that the name of the man who played such an important role in the early development of the electrical industry, whose leadership has inspired and guided so many others, should be given to an active and important part of the great hydroelectric system which he worked so hard to build.

Popularizing the Red Seal Idea

CALIFORNIA has the honor of displaying the first electric home west of the Mississippi to be constructed under the Red Seal specifications. To this home and its owner will go the first Red Seal certificate to be issued in this section of the country. Now that the Red Seal plan has been adopted, it is time for the industry to consider plans for reaping the greatest good from its application.

The specifications as they have been adapted to fit California conditions are interesting. The Red Seal requirements given on another page of this issue are a reasonable minimum standard and are based upon knowledge and study of present-day electrical service and appliances which should be available in the average home. There will be those in the industry who will argue that the requirements are not sufficiently high and also those who will believe that the specifications are too rigid. But a careful study will show that adequate lighting, a sufficient number of convenience outlets for the proper use of appliances, and provisions for the installation of an electric range are the only requisites for a Red Seal certificate.

However, the specifications themselves are meaningless unless they are supported by the industry and sufficiently popularized so that the public will

realize that a Red Seal home is the acme so far as the proper utilization of electricity is concerned. The industry is familiar with what the most complete application of this program will mean from a dollars and cents standpoint. The problem which remains is to acquaint the public fully with the meaning of a Red Seal home. In this connection it might be well for the power companies, the manufacturers and contractor- dealers who will receive the benefits to utilize some portion of their advertising appropriations for this purpose. If it is not possible to wage a cooperative advertising campaign, it is at least possible for the various individual companies to tell the public that a Red Seal home is an electric home.

Ethical Treatment of Santa Barbara Contractors

DESPITE the losses incurred by electrical contractor-dealers of Santa Barbara as a result of the recent earthquake, it is gratifying to note the spirit of optimism which this branch of the industry is displaying in getting back on its feet. On other pages of this issue are photographs of some of the shops, and a letter from the executive secretary of the Electragists who visited the city shortly after the disaster. One enterprising dealer, his establishment partially wrecked, has set up his business on the sidewalk. Across the front of his store is this sign: "Let's forget it and EAT. Cook with electricity."

In his letter regarding conditions in the city Mr. Geisbush sounds a warning which the industry will do well to heed. He cites the tendency of contractors of all classes to make Santa Barbara their headquarters in the hope of reaping some gain from the reconstruction activities. It will be regrettable if the electrical industry of the state permits unjust and unethical outside competition with the established contractors. The industry owes these men who have been an integral factor in the electrical growth of the city for many years the opportunity of recouping the losses they have incurred and of regaining the mental and financial balance which the earthquake destroyed.

DISCUSSION

Gifford Pinchot and "Giant Power"

To the Editor:

Sir—The symbolic term "giant power" which is being broadcast at this time by Gifford Pinchot is indeed a word to conjure with. It fires the imagination by its very vagueness and suggestion. Since the Pennsylvania governor has brought the phrase to us, it deserves analysis for the elucidation of all the people.

In discussing the "giant power" plan, Mr. Pinchot outlines his views on the matter, as follows: there should be a central pool of all electric power from which all the people and industries would be served. This he says would decentralize industry, restore country life and build up small communities and the family. He further states that there is a need for state or national regulation of the electric light industry. And he makes the criticism that the small user of electricity is discriminated against because the unit of power costs him more than does the unit of power sold the large user.

Let us examine these statements for what they are worth, taking them in the order given above.

"Giant power" means the pooling of power from all sources, with distribution from a central point as opposed to the present plan of various companies serving their own territories from their own power stations, and interchanging small surpluses to meet the needs of the interconnected companies. Viewed from one angle, such a pool would result virtually in stripping the West of its greatest natural resource, water power, by taking all that power to a central pool. The West wants industries to come west and use its power. The "giant power" plan wants to take the power to the industries. Viewed from another angle, the "giant power" plan of a central power pool is contrary to sound economic practice. If a manufactured article is transported any distance the cost of the article to the consumer must be higher, on account of the cost of transportation. This is especially true in regard to electric power which, to transmit over distances, requires expensive copper wire, towers and poles, switches and meters and transformers and large crews of men. The people of this state enjoy a low rate because first, their electric energy is developed by water power and secondly the transmission distances are not excessive. But if the electric energy generated at our water power sites is transmitted to a central pool somewhere in the Middle West it will cost the people of the Middle West more. The Middle West can't get cheap power that way, the industries must come to the power sites.

It is a far cry for the imagination to perceive how the central power pool is going to decentralize industry and restore country life. The very statement indicates that the "giant power" advocates do not know whereof they speak; they are politicians meddling in a technical business. Giant power, through its central pool would only centralize industry the more. All industries would crowd about the pool in order to lessen the distance of transmission. Where would the farmer get off at under such a state of affairs? Clearly, unless he moved his farm close to the central pool he would have a difficult time getting any electric service at all, let alone at a reasonable price. Under the present arrangements, power stations are scattered about the country, serving small communities and farms. This is better than throwing all power into a central pool where only centralized industry would benefit.

When Mr. Pinchot states that there is need for state or federal regulation he implies that such regulation does not exist at this time, which is a statement directly opposed to the facts. Are the electric

light companies being regulated? Our Secretary of Commerce, Herbert Hoover says: "There is scarcely a single public utility today that is not under public control through some governmental commission, local or national. These commissions today fix the rates, the issues of stock, the time tables, the car service and the profits. Regulation has through stabilizing rates reduced the cost of capital by increasing the security for the savings of the people. From this security and within our generation there has come a new tide, and that is toward popular ownership as distinguished from government ownership."

In our own state the electric light companies are regulated by the Department of Public Works. Where is the basis for Pinchot's implication that there is no regulation?

The last statement of Mr. Pinchot to be considered and the most peculiar is that the smaller user of electricity is being discriminated against because his electricity costs him more per unit than does the electricity bought by the large user. Of course it costs him more, because to serve him the power company must install the same, and sometimes more, equipment than it does to serve the large user. The cost to the large user is spread over a large purchase of power. This is an economic axiom that you can sell goods in quantities cheaper than you can sell them at a piece. A carload of bread costs less per loaf than a purchase of two loaves. This is the basis of business, wholesale buying and quantity prices.

And so, under analysis, the "giant power" plan is seen as an ephemeral and visionary scheme. The proposed power pool would be uneconomic in practice and discriminatory to the states which would be stripped of their power for the benefit of others. And, rather than decentralizing industry, the power pool would only further centralize it. The regulation appealed for is already accomplished fact. And "giant power" no matter what its politician advocates claim for it, cannot sell small bits of power cheaper than it can sell large quantities.

"Giant power" only means furnishing cheaper power to a few central communities and industries by penalizing the other people and sections of the nation.

E. J. CROSBY,

Spokane, Wash., July 9, 1925.

Washington Water Power Company

Santa Barbara Contracting Conditions Described by Electragists' Secretary

To the Editor:

Sir: I made a trip to Santa Barbara last week for the purpose of aiding in whatever way possible the contractor-dealers of the Santa Barbara district, and I found conditions pretty badly demoralized. You can appreciate that every business man in that community is more or less shaken, wondering what the future holds for him, especially in view of the fact that there seems to be a general move on the part of embryo contractors over the entire state to make Santa Barbara their headquarters for the next several months.

The contractors of Santa Barbara have asked that people having a desire to start in business or extend their activities to that district first communicate with somebody familiar with conditions so that they may receive information of value to them. Anyone interested in that district can get first-hand information by appealing to any reputable contractor in Santa Barbara or to me at Los Angeles.

As matters stand now there are sufficient contractors established and operating in Santa Barbara proper to take care of any of the construction work which may be done, for, contrary to the opinion generally held throughout the state, the work will progress at a slow rate and business buildings will be built only as rapidly as the owners finance the work.

While in Santa Barbara I took several snapshots of the shops there and some snapshots of places where shops used to be. In using these, pay particular attention to the optimistic spirit exhibited by the owners of the California Electric Company as indicated by the sign hung over their front door—"Let's forget it and eat. Cook with electricity."

If you should care to use any of this information in the Journal of Electricity, please stress the need for ethical treatment of the Santa Barbara contractors by anyone called upon to bid on the work of reconstruction. This is a duty that we owe the boys, and certainly no one will profit much by further destroying the conditions of men who are already shaken mentally and financially.

C. J. Geisbush, Executive Secretary,
California Electragists, Southern Division.

Los Angeles, Calif.

[Editor's note: The pictures referred to in the above letter appear on page 108 of this issue.]

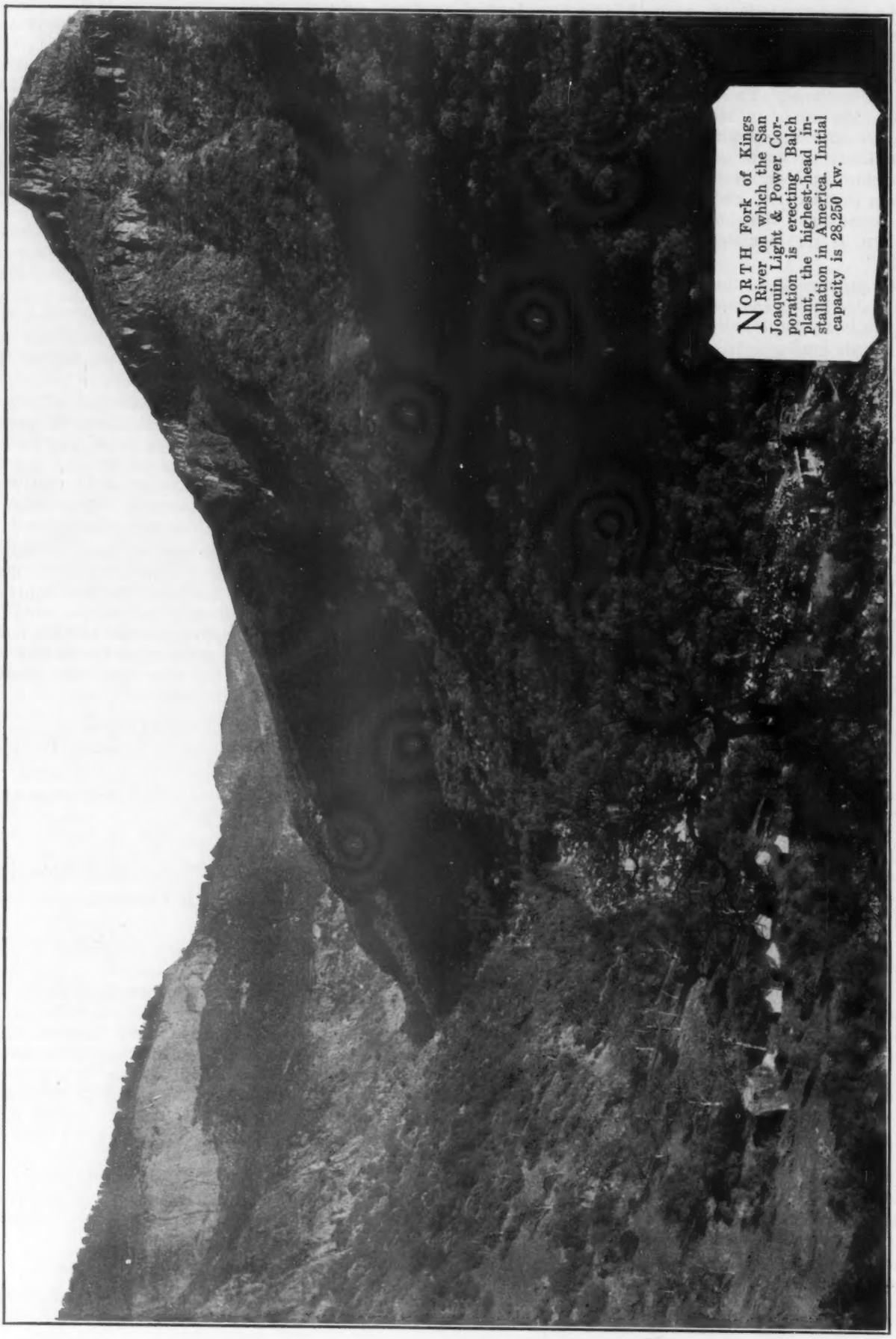
Manufacturer Comments on Article on Electric Air Heating

To the Editor:

Sir:—I have been very much interested in your acticle by Geo. W. Barker on page 361 of your May issue. It contains many arguments which the writer has emphasized for many years and with many power companies and we hope it will have its effect upon the short-sighted officers of many of the power companies who cannot or will not see or appreciate the trend of the times and the fact that the public will have and are willing to pay for electric heat, simply because it is better and cleaner and more desirable in every way.

The writer would like to have the privilege of reprinting parts of this article and if you will grant him this privilege, he will, of course, give credit to your publication and to the author.

P. F. APFEL, President,
Electric Heating & Manufacturing Co.,
Seattle, Wash.



NORTH Fork of Kings River on which the San Joaquin Light & Power Corporation is erecting Balch plant, the highest-head installation in America. Initial capacity is 28,250 kw.

Skagit River Development of the City of Seattle

By J. D. Ross

Superintendent, City Lighting Department, Seattle

AMONG the notable new hydroelectric projects in the Pacific Northwest is the City of Seattle's Skagit River development, the first unit of which has been completed and in operation for almost a year. The Gorge plant, as it is called, has many notable features of interest to engineers. Included in these are the 11,000-ft. concrete lined tunnel and a noteworthy wood pole transmission line.

THE Skagit River development of the Seattle municipal light and power system has received a great deal of publicity during the past six years, which is the construction period of the first unit of the development. This unit of 50,000-hp. capacity was officially placed in operation Sept. 27, 1924, and has been in continuous operation since that time.

The first unit of the development, known as the Gorge Plant, is a substantial and reliable hydroelectric station by virtue of careful design, which takes full advantage of the many favorable conditions for power development found on the Skagit River. The Skagit River itself is the largest stream tributary to Puget Sound, rising in Beaver Lake, B. C., twenty miles north of the Canadian line and emptying into Puget Sound near Mt. Vernon, Wash., being 125 miles long, with a drainage basin of 3,100 sq. miles.

This basin receives an annual precipitation exceeded in few areas in the United States. The large proportion of the basin lying at high elevations makes a condition especially favorable for summer storage in snow fields and glaciers. The flow of the river at the point of diversion of power averages 4,650 sec-ft., forming a 1,200-sq. mile drainage area. With the maximum run-off occurring during the dry summer season, May, June, July and August, and the minimum at times of low temperature, usually from the latter part of December to the first of March, the absolute minimum recorded on the river is 700 sec.-ft. and the minimum of 800 sec.-ft. has occurred only a few days during the years 1909 to 1923, during which records have been kept.

The portion of the Skagit River which is to be utilized for power by the Seattle municipal development lies between Mile 39 and Mile 51 measured from the mouth of the river, although the dam proposed at Ruby Creek will back the water up approximately to Mile 81, just over the Canadian boundary. The drop available for power is from El. 1,600 to El. 485, or 1,115 ft.

With the flow of water available, the potential power that can be developed is 225,000 kw. continuously, representing over 2,000,000,000 kw-hr. per annum. The installed capacity as planned at present is 555,000 hp. which may be increased as required by the character of the load to be carried in future years, and to work in conjunction with steam and other hydroelectric developments on the same system.

The outstanding features of the finished development of this power site are:

1. The Ruby Dam, set in solid granite and 480 ft. high, impounding a reservoir, also in solid granite, of 1,300,000 acre-ft. which will conserve the entire flow of the river to be used as needed for power.

2. The solid character of the rock through which the river flows for its entire course from the Ruby Dam to the lowest power house, which permits of pressure tunnels and guarantees a development of the most permanent and reliable nature.

3. Adaptability of the site to development in steps as the demand for power grows, so that investment charges during development may be made a minimum.

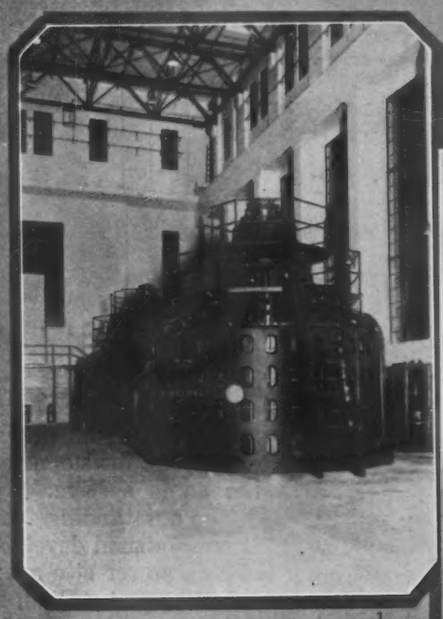
The first unit of the development consists of a power house located just above the mouth of Newhalem Creek, containing two 30,000-kva. Westinghouse generators, each driven by a S. Morgan Smith vertical hydraulic turbine of 38,800 hp. The power house, of reinforced concrete, is made large enough for three of these units, and the foundations, penstocks, and Johnson valves are in place for the three units.

Hydraulic Features of the Gorge Plant

These machines are designed for 375-ft. head and are operated at 270 ft. at the present time or until the proposed Gorge masonry dam is built to raise the head approximately 100 ft. They are fed with water through a tunnel 11,000 ft. long and 20-ft. 6-in. internal diameter lines throughout with 18-in. concrete.

This tunnel runs on an even grade from intake to power house and divides at the lower end into three 10-ft. openings which are lined with steel for the last 400 ft. and each is closed at the lower end by a Johnson valve. A surge chamber of the same diameter as the tunnel is driven vertically through the mountain at a point 1,100 ft. from the power house.

The upper end of the tunnel is provided with steel trash racks and lift gates operated by an electric



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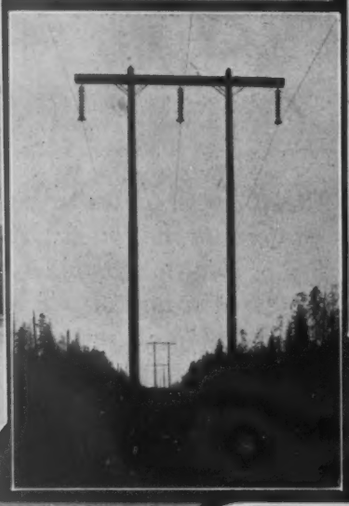

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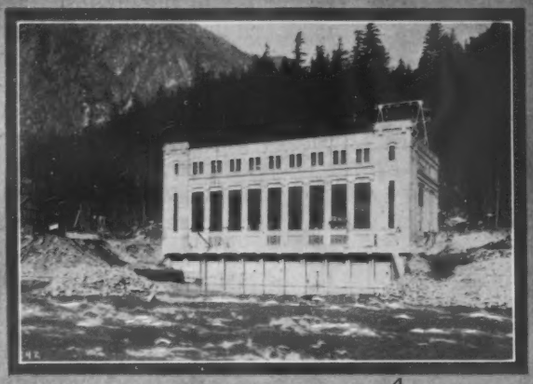

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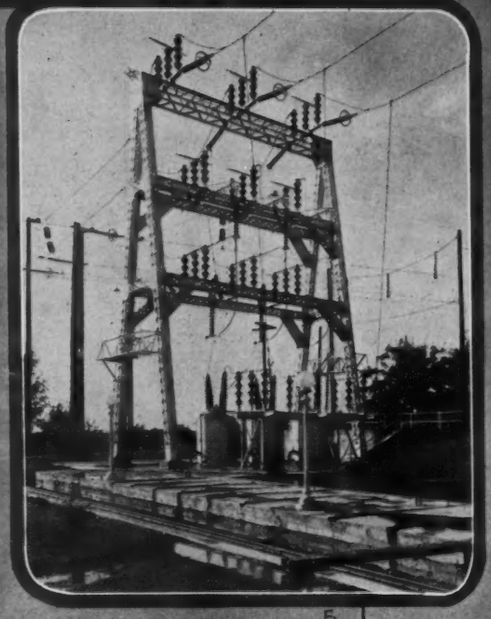

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INTERIOR of the Gorge Plant of the City of Seattle's Skagit River project showing the two 30,000-kva. units is depicted in No. 1. No. 2 presents a section of the 165-kv. transmission line to Seattle. Special steel crossing towers are shown in No. 3. A general view of the exterior of the plant, which will have an ultimate capacity of 225,000 kw., is given in No. 4. Oil switches and a portion of the bus at the receiving substation in Seattle appear in No. 5. The interior of the 11,000-ft. tunnel at the point where the penstocks enter is shown in No. 6.

hoist. Water is diverted into the tunnel by a rock-filled timber crib weir which raises the water approximately 10 ft. and is provided with flash-boards placed in sections 10 ft. long to raise the water 8 ft. higher. These flash-boards are held by steel rods on the upstream side which have a carefully calibrated turned section designed to break progressively across the river as the head over the flash-boards rises, so that in case of flood a sufficient number will be washed out to relieve the pressure and prevent damage.

Transmission System

From the power house the current is stepped up to 165 kv. for transmission to Seattle, 105 miles away. The transmission line right-of-way, secured by easements or deed, is 300 ft. wide to a point about 13 miles north of the city limits, and from there to the North Substation in Seattle 150 ft. This right-of-way provides for four lines to the above mentioned junction point, from which two lines will enter the city from the north and two will be carried around Lake Washington, entering from the south. A single line is in operation at present carried by 11-in. top cedar pole towers of H-frame design. The conductor is 477,000-circ. mil. aluminum cable, steel reinforced, held by Westinghouse No. 601 insulators, twelve in series in suspension and fourteen in series at dead ends, with special high strength insulators at the points of greatest strain.

The most noteworthy feature of the line is the thoroughness with which the guying has been done and the care and design of the cross-arms. The double arm, which is used on the standard towers, is trussed at the center and ends, to greatly increase its strength. Steel towers are used only at long spans for river crossings and at the terminals of the line. It was computed that the saving in fixed charges by using wood poles would permit rebuilding the line at the end of fifteen years and still show a saving at the end of thirty years over a steel tower line. During the first six months of operation this line has a perfect record and it is believed to be the sturdiest wood pole transmission line in the country at the present time.

The North Substation

At the step down station, which is located at the corner of 8th Ave. N. E. and East 75th Street in Seattle, transformers are placed to reduce the voltage to 26,000 volts, 3-phase, for city distribution. These transformers with high-tension switches, are placed outdoors, and the station building contains 26,000-volt bus and switching apparatus. It also contains one 15,000-kva. synchronous condenser used for voltage regulation on the transmission line, with foundations and building space for a second condenser of the same size with its auxiliary equipment.

The step-down transformers consist of three 10,000-kva. single phase units with a fourth, or spare transformer; a second bank of three is to be installed very soon. The building, like the Gorge power house, is of reinforced concrete of the sturdiest and most permanent design.

The demand for power on the Seattle Municipal System is growing at such a rate that the 50,000-hp. unit of the Skagit development will be entirely loaded in 1927 or at the latest by 1928. The original plans for the Skagit development called for building a masonry dam at the Gorge to raise the head on the present units to 375 ft. and provide storage for daily variations in load. On account of the immense storage possible at the Ruby Reservoir, which will conserve the entire river flow for power, it is now planned to build the Ruby Dam as the next step of the development.

Artist's drawing of the complete Skagit River development of the City of Seattle. Gorge power house is in the foreground. The contemplated Ruby plant may be seen on the left bank of river farther upstream.

A view of Denver's movie row showing the large number of electric signs.

Consistently Selling Better Lighting

By S. W. Bishop
Executive Manager, Electrical Cooperative League, Denver

DENVER is regarded as one of the best lighted cities in the United States. Higher foot-candle intensities are employed in store windows, more signs are used and better commercial lighting obtains generally in that city than in many larger ones. In this article the author describes the cooperative efforts which have been employed to sell better lighting and the important part in this work played by the Electrical Co-operative League.

VISITORS to Denver, especially electrical men, express themselves as definitely impressed with the various forms of commercial lighting observed in the downtown section. Block after block of attractive display windows and not just a few isolated installations seem to emphasize this impression. And then on the side streets and out in the residential section the surprise is not dissipated for there during the past year the electrical industry of Denver has obtained marked results with the neighborhood merchants and other industrial establishments.

To what is this betterment of illumination due? From a close-up and possibly prejudiced angle the answer is "Definite lighting sales policy." This does not apply to the Public Service Company of Colorado alone, although it can be said without question that its aggressive commercial policy has dictated unusual activity in this line. Credit must be given to a few lighting equipment manufacturing departments and those contractors having an appreciation of and also ability to sell improved lighting equipment.

Before the sales stage has been reached, however, there are other influences at work — education and example. And here is where all of the agencies listed above come in, plus the Electrical Cooperative League.

Since its organization in 1921, the advisory board of the League has emphasized the possibilities of better lighting and actively extended its field work in that direction. Even in 1923 the establishment of a commercial lighting exhibit was considered but a year later this idea gave way to the one that a "Well Satisfied Customer Is the Best Advertisement."

The establishment of a number of representative installations in both windows and store interiors provided practical ocular demonstrations which automatically would attract the attention and obtain the interest of other merchants and business men. This is true of small establishments as well as large ones for the reason that the smalll merchant obtained ideas from the bigger ones and other smaller stores were quick to realize what competitors in their own class were doing.

In strictly commercial lines this has resulted in

foot-candle intensities exceeding one hundred in more than a score of stores. In the case of two large department and specialty stores, both having arcade windows, the result can be better visualized with the information that on all sides of the windows, reflectors have been installed on 12-in. centers; in one case the number, and a record one, is about 820 outlets and in the other, also a new building, about 330. This does not include spotlight outlets and convenience outlets.

The interiors of both of these establishments are equipped with one-piece, totally enclosed glass units using 300 and 500-watt lamps and even with a high mounting an average counter intensity of 18 foot-candles is obtained.

Adequate Wiring Is First Requisite

Good lighting cannot be secured without adequate wiring. Consequently in the case of new buildings or stores as much assistance as possible is given in advance to the owners, builders, and architects. In both of the comprehensive installations mentioned, this chain of contact was followed and continued until the journeyman mounted the reflector and inserted the lamp.

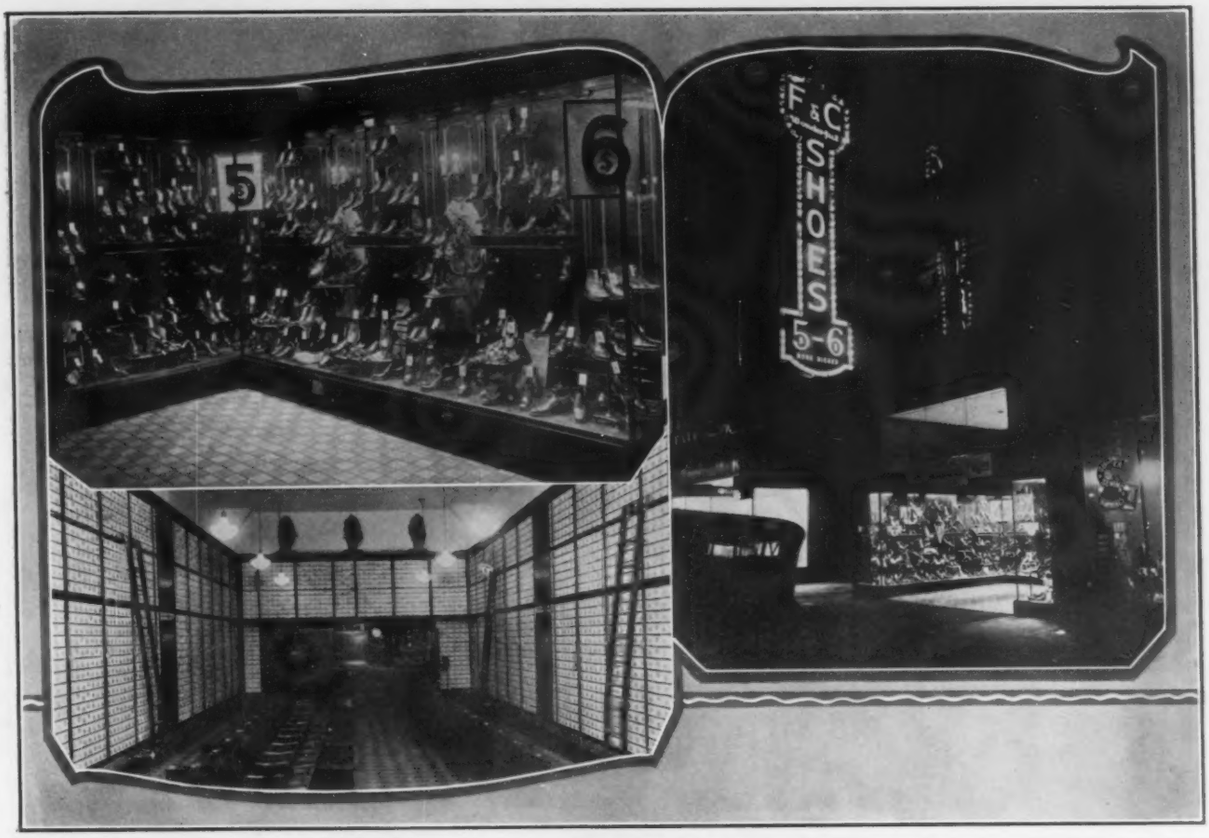
Similar examples on a smaller scale could be cited in outlying stores and in the suburban areas of Denver. An extremely interesting case is that of a small incorporated city adjoining Denver where until a year ago there never had been a mirrored glass reflector installed in any store.

Selling with a Working Sample

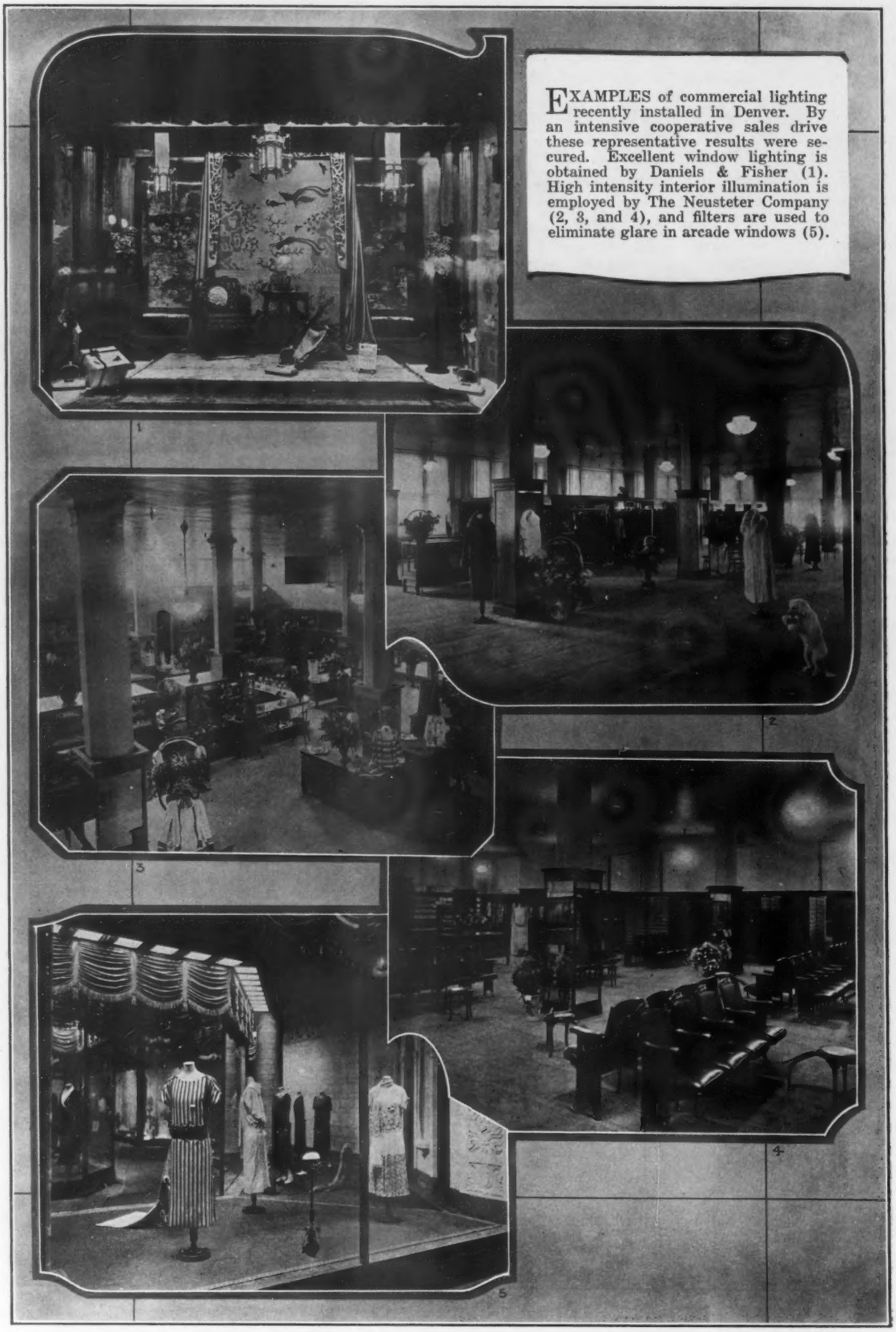
Then thanks to the aggressiveness of the suburban central station, a model window was installed in its own local office and before the campaign was finished ten stores had changed their lighting. The results were sufficiently satisfactory that this same central station then established a flat rate schedule for commercial lighting and went so far as to install a separate circuit and time clock in its office to control the other windows. Before that time, with the exception of Saturday nights and short winter days, window lighting of any extent was not employed by the merchants of that town.

The same standards have not been recommended as a matter of logic to all classes of stores. Proper consideration and due regard has been given to the type of business, its location, activity of competitors, economic investment and any special requirements. When this system is followed it has been found that more satisfaction obtains on the part of the person paying for the installation and each customer regards his lighting in a more personal way, certainly not in the stereotyped fashion of a few years ago when bare lamps and tin shades were the vogue.

Although Denver was one of the first cities in the United States to install ornamental lighting standards in the downtown section, the only change on the three main thoroughfares has been the replacement of arc lights by incandescent lamps mounted in ball globes. On several of the cross streets and main arteries leading from the business section, more



Exterior and interior views of the Denver store of the Feltman & Curme Shoe Company that was equipped during the lighting campaign. The show windows have 200-watt lamps and mirror glass reflectors on 12-in. centers.



EXAMPLES of commercial lighting recently installed in Denver. By an intensive cooperative sales drive these representative results were secured. Excellent window lighting is obtained by Daniels & Fisher (1). High intensity interior illumination is employed by The Neusteter Company (2, 3, and 4), and filters are used to eliminate glare in arcade windows (5).

modern street lighting equipment has been installed by the property owners and merchants on those streets.

Better Street Lighting and Its Effect

This idea has led to the installation of ornamental standards, both cast iron and pressed steel, with proper diffusing glassware, in front of many new store buildings and apartment houses in the residential sections of the city. Garages too have been thus equipped with exterior lighting.

Because of the individual cases, there has been no standardization but every effort has been exerted to insure similar types of equipment which can be retained as part of the main system if those streets are eventually equipped throughout with ornamental street standards instead of the corner arc or enclosed lamp.

The part that this street lighting has played in store lighting has been considerable owing to the problem of comparative intensities. It is a recognized fact that store windows must necessarily be of a higher wattage when the intensities on the sidewalk are greater. This one fact alone was the determining factor in the installation of a large store window downtown although it may be several years before the street intensities will be increased to the point recognized by the present window lighting.

Sometimes there is a backfire in this lighting educational work as demonstrated by a recent installation in a large office on the ground level of a prominent cross street. The recommendations made by the field representative of the league were respected in every detail excepting the method of mounting the reflectors in the window. The office manager it seems had an idea that sidewalk lighting would attract more attention than proper intensity on the displays which were of an institutional nature.

No amount of reasoning would get him to have the diffusing type of reflector reversed. His opinion was quite marked that the long lip of the reflector should point outwards. The valance which was ordered before the installation of the lighting has since been installed. It is of proper depth and conceals the reflectors from view. The valance has cut the light distribution from the sidewalk but the manager is still obdurate in his belief that he has evolved a novel usage for that type of window lighting reflector.

Central Station Activities

Commercial lighting provides one of the chief sources of revenue for the Public Service Company of Colorado. In order to facilitate the sale of energy and to give proper development to the commercial, and incidentally the industrial lighting field, a separate division is maintained in the commercial or new business department to handle this business.

There is a staff of six men under the director of the department and each is assigned to various sections of the city. A designer skilled in sign work also is attached to the department. Through this group all new business is ascertained and a close check maintained on the lighting requirements of all installations in the respective areas of each representative.

These men can be classified more as lighting sales engineers than illumination engineers because their chief responsibility is the sale of adequate lighting equipment rather than the design of lighting installations. However, their work brings up problems of this nature daily and whenever assistance is requested the staff gladly works out designs and takes a chance on a later sale in competition with other firms.

Each representative is held responsible for the commercial lighting sales in his territory. Although the company handles lighting fixtures for homes, this activity is in the hands of other commercial department representatives. Electric signs of course are negotiated by the commercial lighting department. In addition to the designing of the signs the company also maintains a shop for their manufacture and fabrication.

The Public Service company regards commercial lighting activity just as separate and important as power sales. Consequently a definite quota of business is assigned to the department and each representative. Thus far this year, the sales are reported as being in excess of the figure established from the business of previous years.

Where missionary work is being done there is bound to be a number of conversions. Occasional calls of lighting specialists cannot help but break down barriers and dissipate ignorance. New ideas are disseminated. Many calls may be made before a sale results but in the aggregate there is a marked cumulative benefit as reflected by the total value of sales of the Public Service Company of Colorado during the course of a year.

Activity is not confined to new work. The representatives keep track of all new jobs but the real field for development has been found in so-called old work. Relighting a store interior, additional reflectors for the window, a new or larger electric sign and the negotiation of advantageous rates for various classes of commercial lighting service are part of the duties of each representative.

From the central station standpoint, the advantages of such activity are obvious. The most important accomplishment is the "insurance" given the lighting load of the company. The right kind of equipment and of equal importance, the right kind—and size of lamps are provided. Wattage is not sacrificed for "something just as good."

Other Branches of Industry Busy Also

The other divisions of the electrical industry appreciate in the main what the Denver central station is doing for the commercial lighting business. Several of the jobbing houses are placing men on this line of work exclusively. Their services might also be called missionary work but with a direct sales result because the business which they develop is usually turned over to an established contractor.

In the last few months at least a dozen splendid sales have been developed exclusively from the jobbers' efforts, not to mention many incidental sales of equipment.

Contractors, where not specializing in some particular commercial unit, are found to be handling

the proper type of glassware. Totally enclosed single-piece units lead in sales.

One downtown contractor has the franchise for a patented unit, having taken it over from a special sales agency. Several outside salesmen, working exclusively on commission, have been employed continuously and the results obtained are evidenced by the number of those units sold in various establishments, many of them off the beaten tracks of the other lighting salemen.

Another contractor has perfected a two piece commercial unit with a corrugated reflector that has proved quite popular. A large number has been installed through his sales efforts.

Some of the contractors prefer to handle certain exclusive numbers of Eastern glass manufacturers. Although the units may not be classed as those best known in the industry they are generally of high class and there has been a marked improvement in the last year or so of the quality of units handled.

Not many of the contractors are equipped with foot-candle meters or equipment other than the data provided by the manufacturers. Generally it is the contractor himself who handles the lighting equipment sales and a number of them have voiced the opinion that additional practical information is needed on this subject and are interested in some form of instruction on the solution of lighting problems. Through the Electrical Cooperative League, arrangements are being made for a course of study and demonstration, similar to that arranged by the League early this spring for the largest fixture manufacturing company in the city.

Judging by the requests received from architects, merchants, builders and others, the services of the League on commercial lighting problems have proved beneficial both to clients and the electrical industry. This fact is attested by the hundreds of outlets which the League has added to installations as a result of its recommendations.

There are a number of outstanding commercial lighting installations in Denver and records disclose the fact that the League played no small part in "putting over" the idea. The results speak for themselves.

Whether it is a complex or simply a consciousness of the advantages of better lighting, especially of a commercial character, the fact remains that the sale of an idea precedes the sale of merchandise; that education is the most effective weapon against ignorance; that example sets a precedent—and that good lighting can be sold where there is a mind for it.

Denver may not be the best lighted city in the country but it is generally admitted that it ranks with the top-notchers. The electrical industry of Denver is doing its best consistently to sell good lighting.

Public Utility Good Will Advertising

By Norwood W. Brockett*

Director of Public Relations, Puget Sound Power & Light Company, Seattle

THE average public utility has, in the past, been the poorest salesman found in any business. This is especially true when it comes to selling itself to the public. This condition is not to be wondered at. In the production of electric energy, gas or telephone service, and in the maintaining of uninterrupted service these industries necessarily have developed the best engineers in the world and that is equally true of our accountants. Such a utility is generally the only one furnishing a like service in the territory which it serves. Since we are dealing with a commodity which is almost essential to every home, it has not been necessary until recently that we should pay any particular attention to the sales end of our business. When people desired our service, they either telephoned or came to the office and purchased it under the terms and conditions and at the price laid down by the state regulatory body.

Nor did it apparently occur to these utilities that it was necessary to advertise the company itself, the service it was giving or what it was trying to do to help build up the community. For years we proceeded upon the theory that any business institution which treated its patrons courteously, which tried to give the best possible service at the lowest possible cost and which did its full share in the civic activities of the community, in time must necessarily win the good will of that community.

Unfortunately, this seems to be true of every other line of industry except the public utility business. No utility company has, even today, the same measure of good will with the people which it serves that is enjoyed by the other business houses in the same locality, and the reason for this is very obvious. No other industry in the world has been subjected to the same constant, malicious attacks by the demagogue and the office seeker. When a candidate was unable to obtain votes by reason of his own unfitness for an office, he always was assured of a certain support by launching a malicious attack upon any of the public utilities in his district. Following the belief that we were to be judged by what we really did and not by what some self-seeking individual said about us, we complacently permitted these attacks to go unchallenged and unanswered and neglected to place the truth before the people.

We now have learned, however, that we must not only give good service at reasonable rates but that we also must tell the people we are doing it and publicly disprove the unwarranted attacks made upon us. I know of but two ways in which this can be done—by the spoken and the printed word. I believe the spoken word to be far more effective with the limited number of people that can be reached,

*An address before the convention of the Pacific Coast Advertising Clubs Association, Seattle, June 20-23, 1925.

but to carry our message to the vast majority of our customers the printed word must be used. Unquestionably the most effective method is through the advertising columns of the newspapers.

Those utilities which adopted this policy immediately met the full fury of those demagogues whose chief stock in trade was the vilification of the utilities. They resented having their statements challenged and disproved and realized that their power would be broken when the truth about the utilities became generally known. In self-defense they immediately termed all such efforts by the utilities "propaganda" and glibly talked of "millions" being spent by the utilities in an effort to deceive and mislead the people. Some of the very newspapers whose advertising departments had convinced us of the necessity of such advertising gave free space to those who criticized us for doing it and in a few cases even took us to task in their editorial columns. Gradually, however, the people are beginning to realize that the things which we are telling them are true, and they are beginning to wonder why our industry is not permitted to conduct its business just as every other business is conducted, unhampered by constant political attacks.

Please do not infer that our work has been accomplished. It only has been started. When you can truthfully tell the people that, under regulation, you are permitted only to earn a reasonable return in the shape of interest and dividends upon the actual value of your properties and upon the money honestly and legitimately invested to make the service possible; when you can tell them that since 1913 the cost of living has gone up sixty-five per cent while the cost of electric energy actually has decreased; when you can tell them that the bill for the average residence consumer for electric service, including not only his lighting but all the socket appliances he uses, is less than $2 a month, he must, in time, believe that you are furnishing a real service and that you are entitled to his respect and confidence.

In spite of what we have accomplished, the average citizen today still believes that there is something mysterious and unusual about the conduct of a public utility. He still believes that enormous profits are being made by these utilities. While he knows that the governmental bodies have made a colossal failure of practically every line of business endeavor in which they have entered and while he knows that the government could not run his business as economically or as successfully as he can himself, he still has a lurking idea that running a public utility is different and that possibly the city or the state or the national government could be successful in that particular business. He still believes that the water powers of the nation are being "grabbed" by "private interests" and used to exploit the people. He still fails to realize that every kilowatt of electric energy generated from these water powers is sold at a price fixed by his own regulatory body and that tremendous sums are paid in taxes each year as compensation to him for their use. These are some of the problems with which the average public utility is confronted and which can be solved only by taking the public fully into our confidence and by using every medium available to place the true facts before it.

In closing, just a word of warning. Any utility whose house is not in order and which cannot give this full measure of information to the people had better pursue the old policy of saying nothing. Every public utterance by a representative of a utility and every printed line used by it must be the exact and literal truth. Let our opponents spread the falsehood and, while it is going to be a hard, discouraging battle, I personally am fully convinced that in the long run "truth must prevail."

Utah Company Starts Refrigerator Drive With Polar Window

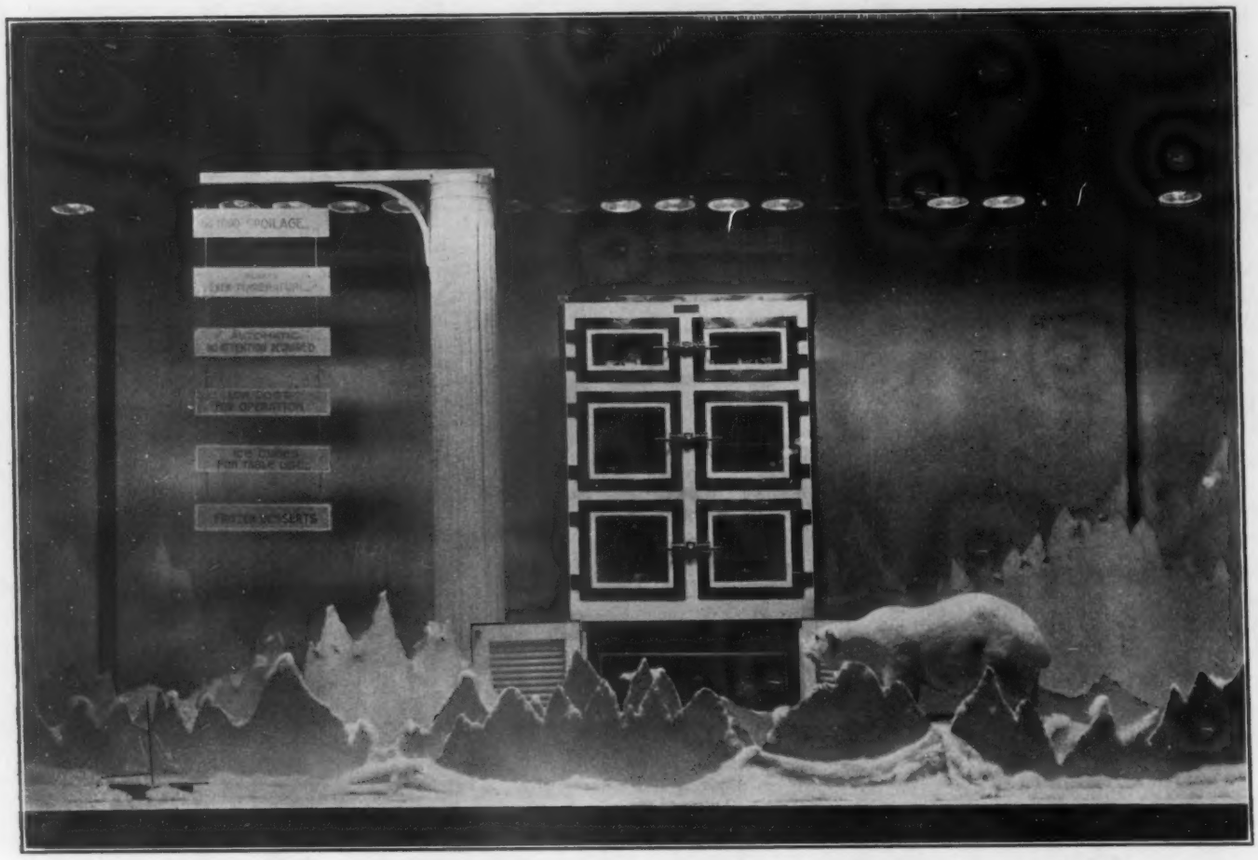
IT is estimated that less than fifty per cent of the households of the country possess refrigerating apparatus of any kind and that less than half of those using "ice chests" are receiving satisfactory service from their equipment. The realization of the wide field thus left open for electric refrigeration among those now only partially served or not served at all, not to mention the greater convenience and the economy of electric operation, has led central stations in all parts of the country to take up electric refrigerating equipment as the next great step in household electrification.

One of the latest recruits to join these ranks is the Utah Power & Light Company, which has started an electric refrigeration campaign in Salt Lake City. This involves a preliminary education of the public through advertising and through personal calls that already has resulted in numerous sales of equipment within the city territory.

A refrigerator is on display in the company's shop, and much is made of this seasonable atmosphere in window and store decoration.

The present-day interest in polar expeditions and in the far North was capitalized in the recent window which featured the electric refrigerator and which attracted considerable popular interest. This was an Arctic scene with realistic icebergs and a polar bear, among which the refrigerator stood in effective prominence. The polar landscape was manufactured by the use of cardboard cut in jagged outline and covered with cotton batting.

Ice crystals such as are used in Christmas-tree decoration completed the effect. At one side a tiny sailing vessel of the toy variety, covered with "ice,"



Window display of Utah Power & Light Company used to direct attention to the utility of the electric refrigerator.

was frozen into the blue-green ice floe which made the floor of the window; at the other a lifelike polar bear investigated the workings of the refrigerator's machinery. A white painted pillar, presumably the North Pole sought by Amundsen, stood beside the machine giving height to the scene from a pictorial standpoint and, incidentally, bearing in standard form a series of cards which told the story of the convenience of electric refrigeration. "No Food Spoilage," ran the first, followed by: "Always Even Temperature," "Automatic — No Attention Required," "Low Cost of Operation," "Ice Cubes for Table Use" and "Frozen Desserts." These cards were simple and legible and yet decorative in their arrangement.

The white background not only gave an atmosphere of coolness to the scene but provided an excellent contrast to the dark touches and bright metal trimmings of the refrigerator. This equipment, as was desired, dominated the picture and attracted all eyes. A machine with glass doors and three double compartments was displayed. Actual food was kept in storage there so that the refrigerating effect of the equipment in active use might be impressed upon all who passed the window.

The effectiveness of the display was largely due to its strategic location in the "island" window, which is so prominent a feature of the Utah Power & Light Company's new store below the Kearns Building. The frontage is on the main business street and, as entrance to the store must be made from either side of the window to the open doorway which is directly in its rear, all who had occasion to transact business with the bookkeeping or commercial departments of the company had an opportunity of viewing the scene from all sides. The window is wired completely so that the illumination at night brings out the full effectiveness of the scene. Convenience outlets provide the proper connection for operating the machinery.

In addition to the original artistic display, a temperature-recording machine later was installed in the foreground of the window. This showed graphically on a chart the record of actual temperatures within the refrigerator, demonstrating both the extremely low temperature reached and the evenness with which it was maintained. Inasmuch as the importance of both these features in the preservation of food had been emphasized in all advertising done, this chart was always a matter of great interest. That its message carried its effect was shown by the number of people who stopped and studied it in detail. Through this chart much information was disseminated most effectively.

With the campaign hardly more than started, a sale of more than twenty machines is recorded, with more in prospect. The success of this program, as well as the advantage of the refrigerating load from the company's standpoint, is expected to lead to further sales effort throughout the year and the extension of the campaign to all parts of the company's territory.

CENTRAL STATION CONSTRUCTION OPERATION AND MAINTENANCE

Testing Methods Employed on Transmission Towers

Service Tests of Severest Nature Accurately Simulated by Testing Rigs at Manufacturing Plant

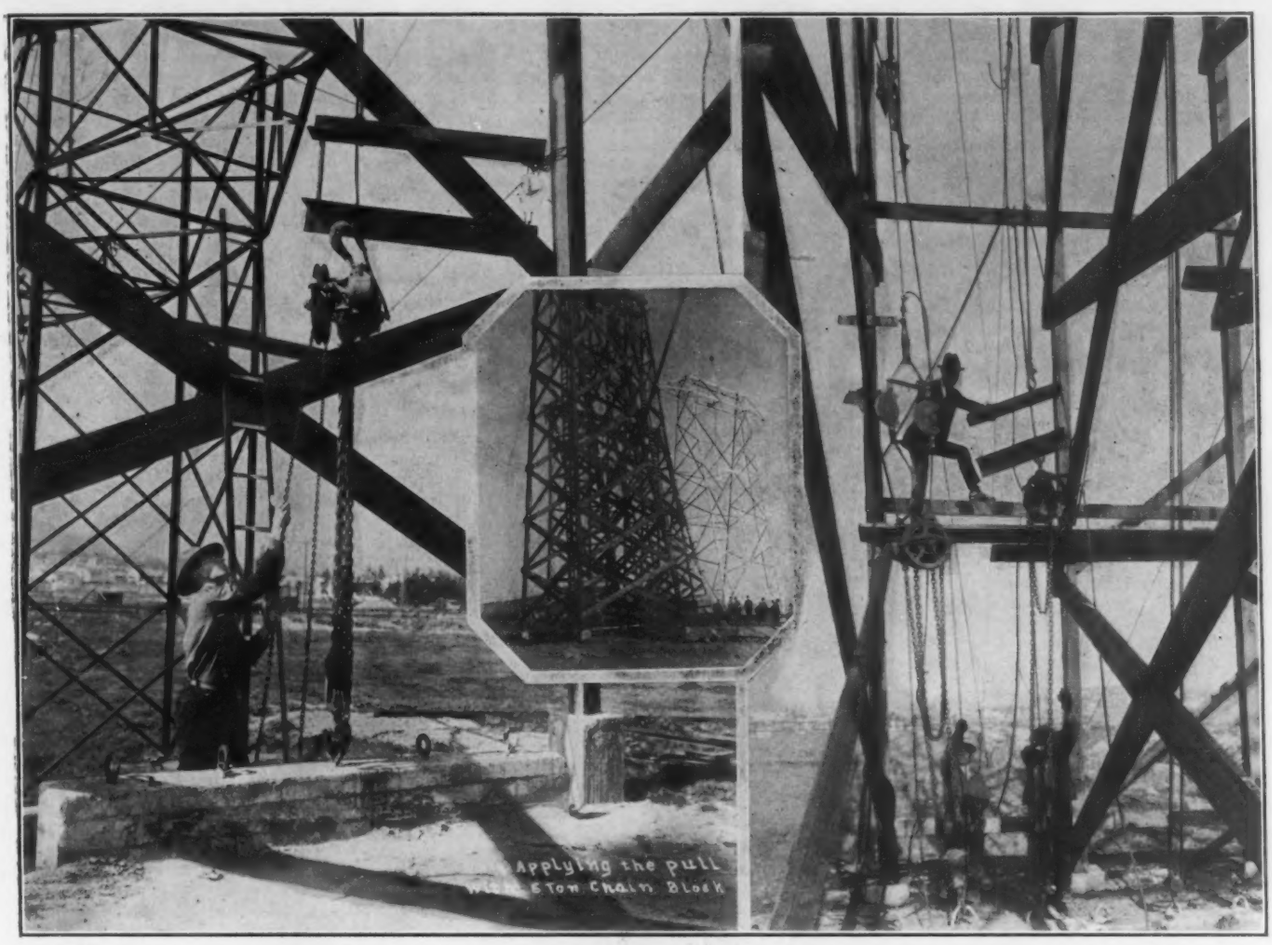
By C. H. TALLANT
Pacific Steel Company, San Francisco

The importance of long-distance, high-tension transmission in the general scheme of things in Western power development has placed a corresponding importance on the steel towers that support the lines. As each new line has been projected, new ideas have been worked in and new demands made on the steel towers that they may meet most efficiently and economically the conditions of the line in question.

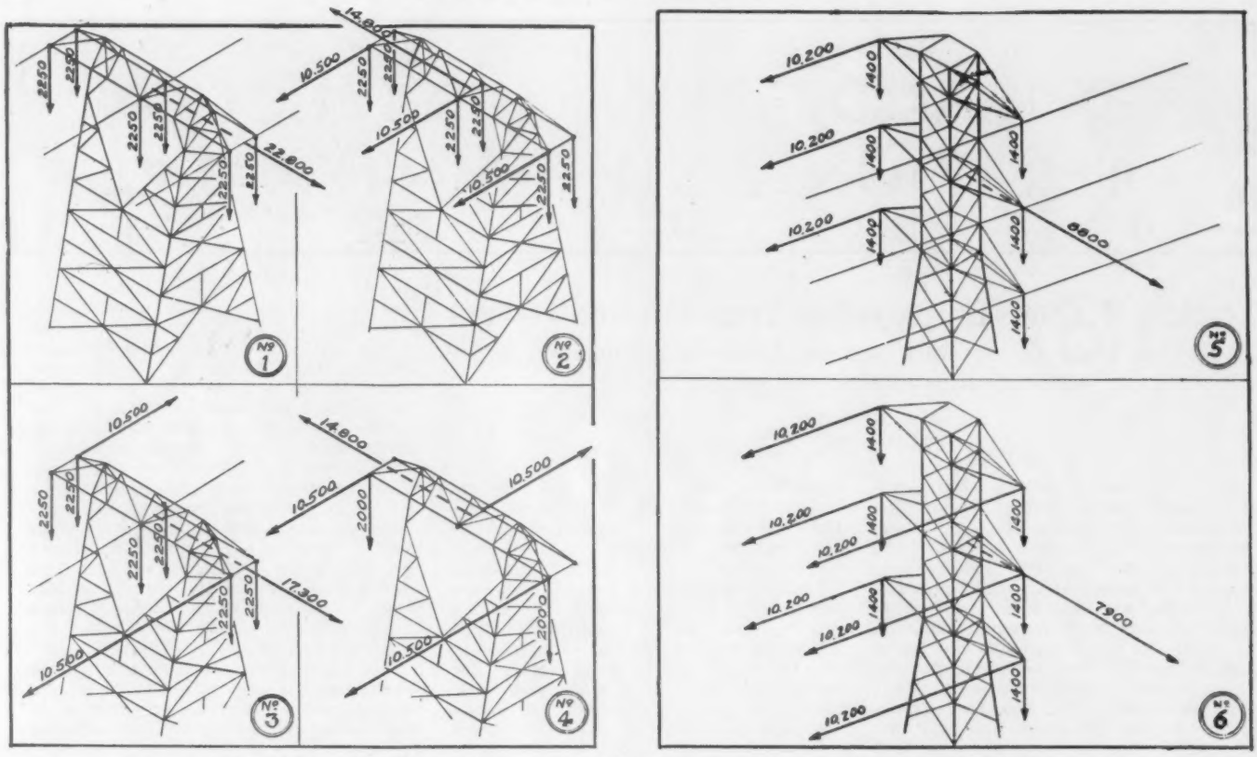
Standardization in design of transmission towers for more than any one particular line so far has seemed largely impracticable because no two lines have the same combination of voltage, carrying capacity, weather conditions and right-of-way restrictions. Also the time which elapses between the building of one line and the next by any one company is usually such that more or less progress has been made in the treatment of tower design. The towers for each new line, therefore, have been of substantially new design with the attendant variations in stress diagrams, details and construction. Some means of learning, before erection in the field, just what each new tower will do when in service is of great value, and it was for this reason that the Pacific Coast Steel Company erected a full-size tower-testing block at its tower plant in South San Francisco.

By means of this testing block, loads of any magnitude and character may be applied to the tower under test and accurate readings taken of the loads as they are applied. The deflection of any specified point on the tower may be ascertained accurately, simultaneously with the readings of the loads. Thus a complete record of the behavior of the tower under test can be obtained.

The three loads or types of loads which are usually applied to towers being tested are longitudinal, transverse and downward vertical loads. These

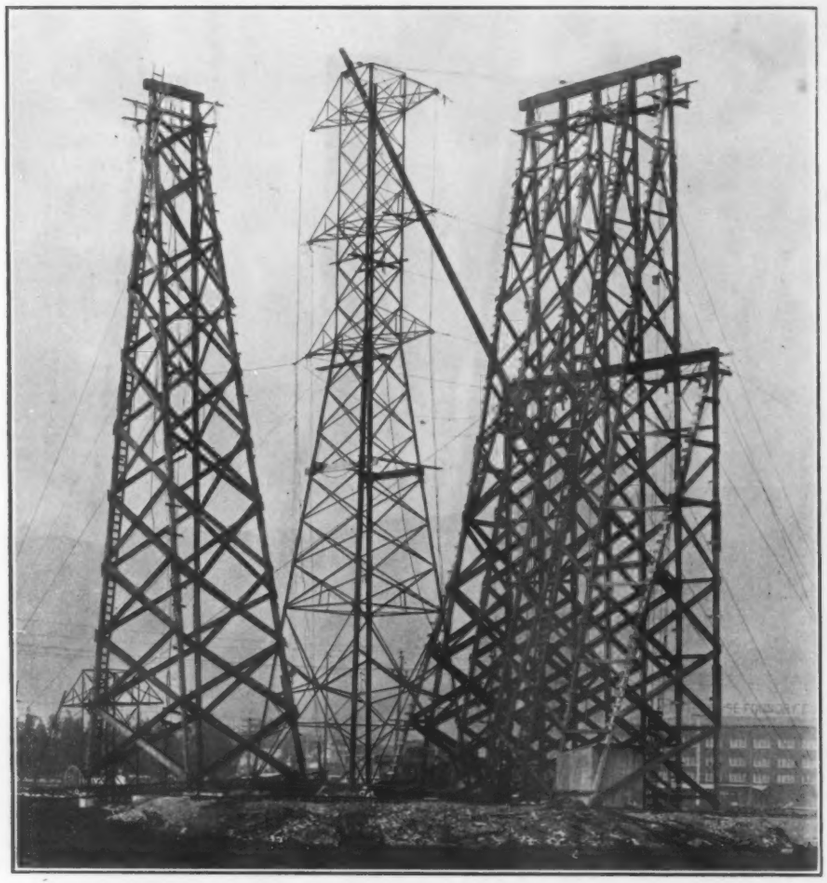


Showing the methods of applying the test stresses to towers through the use of 8-ton chain blocks. Loads can be applied successively or simultaneously, as desired by the purchaser. Note the dynamometers rigged just above each block for indicating the stress. These are normally read from a distance through tranaits. The insert shows a single-circuit dead-end snow-type tower under test. A tower similar to this one was subjected to a combined test loading of 104,000 lb. without failure in any member. Note the boom with a loop slung through the tower to prevent the tower from falling in case the tests are carried to the point of destruction



Showing direction and magnitude of typical test loads as applied to towers on the testing block

three represent, respectively, the stress in the conductors or the torsion and breast pull resulting from broken wire conditions and dead-ending the line, the pressure of cross winds, and the dead load or weight of conductors and insulators. They constitute the equivalent of the service conditions which the tower is expected to meet, either normal or abnormal.



Testing a valley-type dead-end tower with over 70,000 lb. horizontal pull. The combined longitudinal transverse and dead loads applied simultaneously to this tower totaled 87,500 lb.

The amount of each load is dependent upon the line conditions of the particular line and the working stress of the steel which is adopted when the tower is designed. It is common practice in tower design to fix the maximum load which the tower is expected to carry under service conditions. This is called the working load. A factor of safety then is adopted in the ultimate strength of the tower as protection against failure under abnormal stresses. This factor of safety is usually 1½, based on the working loads. Thus, failure of the tower should not occur until a load at least 50 per cent above the assumed maximum service load comes on the tower. It is through enabling the investigation of a tower stressed up to the destruction point, under known load values, that the testing block proves its worth.

The full-sized tower tests on the testing block are always made on a specimen tower before the fabrication of the order. If a weakness develops somewhere in the tower or in the crossarms and failure occurs before the full calculated load has been applied, it is a simple matter to strengthen the member affected. In this way loss occurs from discarded parts or duplicated effort or through the much more serious delay in field erection, as the only thing necessary is a change in the design details covering the weak member.

There also have been instances where towers were found to be designed heavier than warranted by service requirements. The tests on the testing block brought out this fact and resulted in substantial reduction in tower weight through the substitution of lighter members for those which had proved to be heavier than necessary. This, of course, resulted in decreased cost per tower.

As will be noted from the illustra-

tions, the testing block consists of two heavy wooden frames set with their axes at right angles to each other. A steel base capable of accommodating towers of varying sizes is permanently in place in front of the two wooden structures. Bent angles and plates are bolted onto this steel base at the required points to form the test stubs. The test tower is erected on these stubs and the rigging fastened in place for the test. Dynamometers are used to indicate the loads, and the deflection is read through a transit set up in the field adjacent to the testing block. A measuring scale graduated in inches and fractions is mounted on the tower at the point where the deflection is to be read. Loads are applied in the sequence specified by the purchaser through chain blocks located on the rigging and fastened to concrete anchors. The dynamometers are in place just above the chain blocks. Readings are taken on the dynamometers at stated intervals as the loads are applied and the corresponding deflections read simultaneously. It is thus possible to study the action of the tower under varying stresses, up to the point where destruction may be expected if this is desired, and locate exactly any member which may be overstressed.

Another advantage of testing the specimen tower on the testing block is the opportunity given to try out new ideas or short cuts in erection procedure that have for their object the reduction of the time required to erect the towers in the field.

Complete Line of General-Service Motors Redesigned

With the marketing of a new type of direct-current motor and a redesigned type of alternating-current motor, the General Electric Company now is manufacturing a completely revised line of general-purpose motors. This line includes standard speeds and horsepower ratings for use on standard circuits.

Distinct advantages are claimed as a result of this revision. The use of the steel-shell babbited bearing has been extended to cover all general-purpose motors. While strongly advocating the use of sleeve bearings, provision also has been made to furnish many standard types of general-purpose motors with ball bearings for use by those who prefer this type. A further advantage resulting from the revision is the fact that some of the smaller direct and alternating-current motors are mechanically interchangeable, rating for rating.

The redesigned alternating-current motors are for use on polyphase circuits and are made in the squirrel-cage and the wound-rotor design. Standard power ratings range from 5 to 200 hp. All are of the skeleton-frame type and include both horizontal and vertical machines. Improved bearing construction is the keynote of the redesign of the alternating current type. Details include larger shafts and bearings, larger oil rings with lower oil level and larger oil-reservoir capacity and other similar features. The improved insulation now included on smaller sizes makes these motors suitable for operation in places where special atmospheric conditions are encountered. The redesign of bearing housings is expected to eliminate minor troubles from oil leakage and to reduce the maintenance cost and amount of attention required.

The new direct-current motors include both constant and adjustable speed machines. In view of the very flexible electrical and mechanical design, many older types now are superseded by the new lines. Thus the same line runs from slow-speed blower motors to high-speed motors for driving pumps, including the intermediate types.

The two-pole machines range in size from ½ to 3 hp., 1,750 r.p.m., and the four and six-pole machines from 3 to 200 hp. Speeds used are 1,750 and 850 r.p.m., these corresponding with full-load speeds for General Electric 60-cycle induction motors. Thus the motors are made for use on standard circuits of 115, 230 or 550 volts.

The outstanding improvements found in the new direct-current line are mechanical. The standard General Electric steel-shell babbited bearing linings are used except in cases where ball bearings are preferred. The popularity of th riveted-frame construction for small ratings of alternating-current motors led to the adoption of this type of frame in the new small motors.

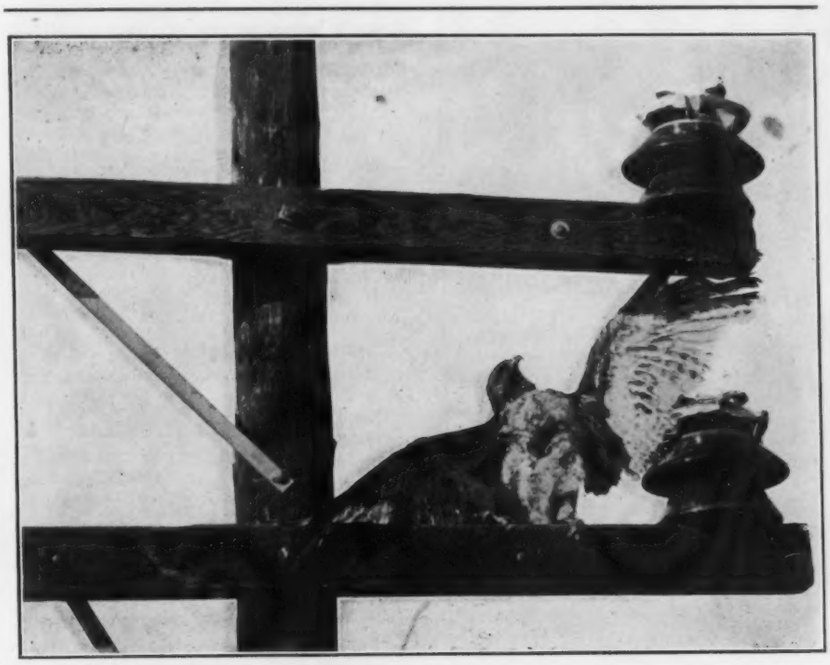
An outstanding advantage of the standardization of these general-purpose motors is the simplification of the renewal-parts problem with specific reference to bearing linings manufactured for alternating-current types, both single and multiphase, thus enabling motor dealers to supply bearings for either alternating or direct-current motors from the same stock. Most of the bearing linings also are interchangeable in any given type of motor. A total of approximately 2,500 listed ratings utilize not more than 23 different bearings.

Sandstone Rapids Development to Be Full Automatic

The Sandstone Rapids hydroelectric development of the Northeastern Power Company located at Sandstone Rapids, Wis., will be equipped with automatic switching apparatus manufactured by the Westinghouse Electric & Manufacturing Company.

This installation will consist of two 2,400-kva., 6.9-kv., 3-phase, 150-r.p.m., vertical water-wheel generators with 125-volt, direct-connected, flat-compound-wound exciters and operating under a head of approximately 42 ft. The generators will be connected to the line by means of automatic synchronizers which will insure the machines being in synchronism with the rest of the system when the oil-circuit breakers close.

This is the third automatic hydrostation on that company's system. All are controlled by means of the audible-type supervisory control operating over the telephone line connecting the dispatcher with each generating station, and permitting fully flexible operation.



One hawk plus one 44-kv. transmission line equals the results shown above: broken insulators, ruined hawk, line down and several hours service outage. Location—near Denver, Colo.

Electrical Device Retrieves 6,000 Sacks Cement

Preventing waste wherever possible is the established policy of the construction engineers of the Pacific Gas and Electric Company. Many small economies run into big money when accumulative results are considered. One such economy was effected on the Pit River No. 3 project. Electrical machines for the cleaning of cement sacks proved to be a valuable investment upon which the return was well worth while.

Somewhere in the neighborhood of 800,000 sacks of cement were used on this job. Most of this quantity went into the dam structure and into the lining of the 4-mile power tunnel. The use of the electrical sack cleaner retrieved some 6,000 sacks of cement that otherwise would have been wasted as far as the job was concerned. While the actual amount of cement saved was only about three-fourths of one per cent of that used on the job, the monetary saving was some $8,000 net. This amount is worth consideration.

Service Car Arranged for Tracing Radio Troubles

Portable Radio Set Complete With Loud Speaker and Loop Aerial Mounted in Coupe for Trouble Shooter

By W. R. CORNELL
Test Engineer, Portland Electric Power Company, Portland, Ore.

Equipment used by the Portland Electric Power Company for locating sources of radio interference is shown in the accompanying illustrations. Fig. 1 shows the general arrangement of the set and auxiliary apparatus mounted on a Ford coupe as generally used. The receiver is strapped to a shelf which is hung from the dash within easy reach of the operator of the car. The loop aerial is supported from brackets on the left-hand door hinges where it can be swung in any direction by the operator and does not interfere with the use of the door. The loop is connected to the set by heavy, rubber-insulated, flexible cables braided together to prevent change in the intercapacity to leads with resultant detuning of the receiver.

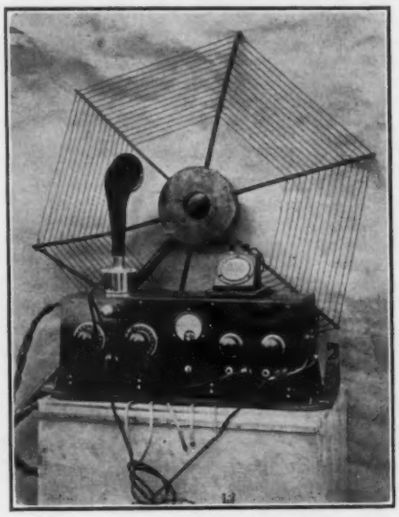
The triangular frame shown is an exploring coil of some two thousand turns of wire which, when connected to only the audio amplifiers of the receiver, enables the operator to pick up audio frequency signals and to follow overhead and underground lines upon which there is a flow of current or upon which a known signal has been imposed. A smaller rectangular coil (not shown) also is made use of in determining upon which one of a number of lines or drops the current causing the interference is traveling. This coil also is used for determining grounds in trees, on poles and other similar locations. It has been found that there often is an audio frequency signal or noise present in the immediate vicinity of the source of radio frequency interference. The radio receiver indicates the general location of a radio disturbance, but oftimes fails to indicate the exact source. In these instances the above-mentioned exploring coils are useful.

The radio receiver used embodies a slight modification of the "Best" superhetrodyne circuit. This combination was selected after months spent in experimenting with various receivers and combinations of apparatus. Referring to Fig. 2 it may be noted that the receiver is very compact, measuring approximately 21 in. long, 7 in. deep at the bottom, and 6 in. at the top. The receiver is remarkably stable in its operation, as instanced by distant stations remaining in sharp tune without touching the controls while traveling several miles over rough roads and streets. The receiver is extremely simple in operation. It is necessary only to adjust the two dials shown at the left of the panel after bringing the filament voltage to a proper value.

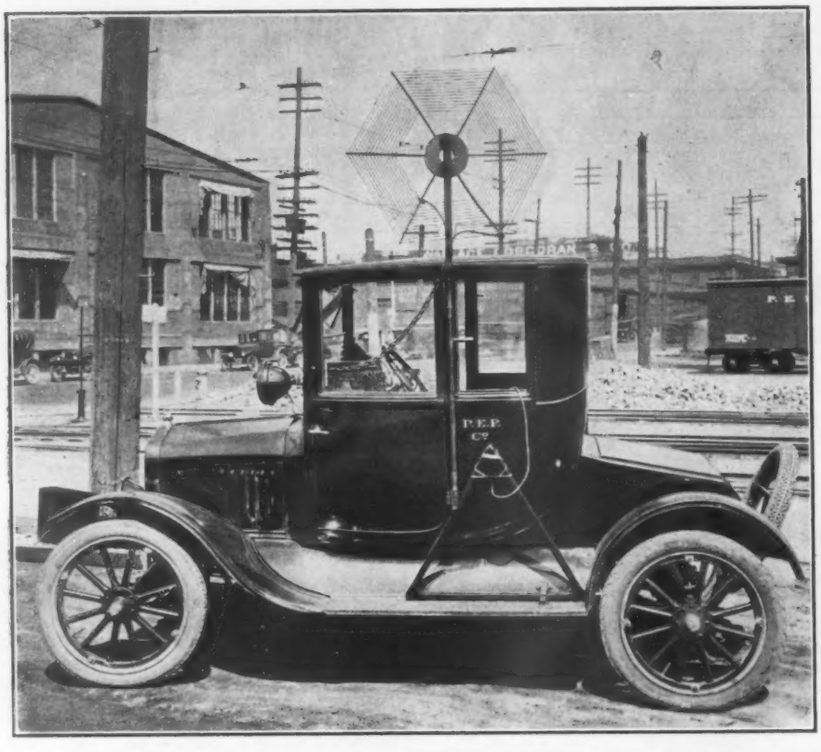
Signals are made audible with a loud speaker having a small rubber horn placed in the left rear corner of the coupe behind the operator. A thermo galvanometer (shown on top of the receiver) connected to the output of the receiver through a suitable transformer has proved invaluable in determining the strength of signal, condition of receiver and other important information.

The loop is of the hexagonal "pancake" type wound with braid-covered enameled wire supported on bakelite spreaders. This arrangement has proved to be unaffected by weather conditions. All connections to the receiver are made through standard telephone and cord-tip jacks, allowing the entire equipment to be removed instantly from the car.

Both "A" and "B" batteries are carried under the seat of the car. Ten type UV-199 tubes are employed in the receiver, which is the only receiver found in which there is a complete absence of microphonic noises or ring from this type of tube. The receiver is shielded completely with 20-gage brass which materially decreases any disturbing influences from electrical equipment on the car. No means has been found, however, of entirely eliminating interference from the ignition spark without destroying the effectiveness of the spark for ignition purposes. A push-button switch has been mounted on the steering wheel of the machine enabling the operator to cut off the ignition momentarily while observing a weak signal.



Equipment used by Portland Electric Power Company for running down radio interference troubles



Radio test car rigged out by the Portland Electric Power Company for use in tracing cases of radio interference

Presidential Efficiency

According to popular rumor, an aspiring reporter once attempted to interview President Coolidge:

"Do you wish to say anything about the World Court?"

"No."

"What are your views on disarmament?"

"I am not prepared to say."

"Will you state your opinion of the farm bloc?"

"No."

"Have you anything to say about prohibition?"

"No."

"About immigration?"

"No."

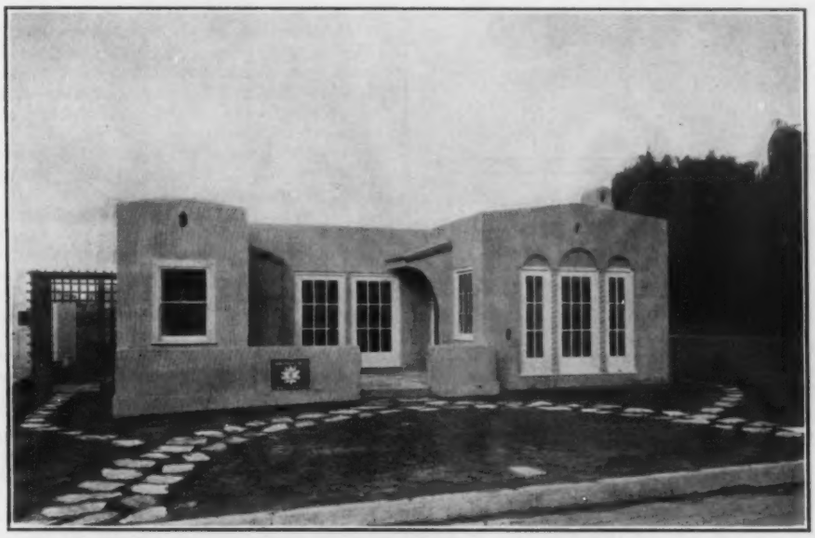
"About taxation?"

"No."

The now perspiring journalist turned to go.

"By the way," added the President unexpectedly, and hope arose in the forlorn reporter, "don't quote me."

IDEAS FOR THE CONTRACTOR



Exterior of Red Seal electric home opened at Santa Cruz, the first to be constructed under these specifications west of the Mississippi River.

Red Seal Electric Home Opened In Santa Cruz

First Home Constructed Under Red Seal Specifications West of the Mississippi River Supervised by Bureau

The first electric home to be constructed under the Red Seal specifications west of the Mississippi River was opened at 41 Miles Street, Santa Cruz, Calif., on July 24 and will remain open until Aug. 2. It was built and is being exhibited under the auspices of the California Electrical Bureau in cooperation with the electragists and others in the industry in Santa Cruz. George M. Rankin of the bureau is in charge of the home, assisted by M. L. Foster of the Coast Counties Gas & Electric Company.

Three 3-page sections in each of two newspapers were devoted to informing the public of this home previous to its opening. Marked signs throughout the city gave directions for reaching the site by automobile. The home is open from 2 p.m. to 10 p.m. daily and from 12 m. to 10 p.m. on Sundays. At night it is floodlighted.

Red Seal Specifications

The minimum requirements for a Red Seal installation as announced by the California Electrical Bureau are as follows:

General: As a service to home-owners in California, the following requirements for an adequately wired home have been prepared by the California Electrical Bureau and approved by the Society for Electrical Development. These requirements are considered as a reasonable minimum standard, and are based on knowledge and study of present-day electrical service and appliances which should be available in the average home.

A copyrighted Red Seal and Red Seal Certificate will be awarded only to residence buildings wired in accordance with these requirements, and will serve the public as identification of buildings so wired.

Wiring plans should be submitted to the California Electrical Bureau, or its accredited representative, for approval before wiring is started. Before permanent Red Seal and Certificate will be issued, opportunity must be given for inspection of finished installation by bureau representative. Also, the entire equipment must be installed in accordance with National Electrical Code Rules, city or town ordinances, and lighting company's rules; and must be inspected and approved by the inspection department having jurisdiction.

Special Requirements

Service—1¼-in. conduit or larger, carrying three No. 4 wires, or larger. At the meter location space must be provided for a meter box or board not less than 30-in. x 30-in. for the main switch and meters.

Switches—All switches shall be of the flush type, conveniently located; and where two or more are brought to the same location, they must be grouped under a single plate.

Convenience Outlets—All convenience outlets shall be complete with receptacles of the flush interchangeable type, conveniently located with respect to furniture spaces. Unless otherwise stated in requirements, multiple receptacles under one plate will be counted as one outlet.

Range Outlets—A 1-in. conduit, or larger, must be provided from the meter board to the range location, carrying three No. 8 wires, or larger, terminating in the kitchen in a box equipped with a blank cover, if a range is not to be immediately installed.

Branch Circuits—Convenience outlets shall be wired on circuits of not smaller than No. 12 wire, with a maximum of 8 outlets per circuit. No convenience outlets shall be connected to lighting circuits.

Bells—Wiring for push button for main entrance door and trades entrance, and corresponding bells or annunciators. Provision shall be made for the attachment of transformer or batteries.

Minimum Lighting Wattage—All rooms shall be wired for a minimum of one watt per square foot for general lighting, exclusive of auxiliary lighting (such as table lamps, floor lamps, etc.) which shall be provided for on the convenience outlet circuits.

	Convenience Outlets	Single Pole Switches
Porches		1
Hall (reception)	1	1
(3-way switches required if hall is over 15 ft. long. On all two-story houses, two sets of 3-way switches required, separately controlling lights in upper and lower hall)		
Other		1
Rooms—		
Living	2	1
Parlor	2	1
Library	2	1
Conservatory	1	1
Den	1	1
Sun	1	1
Dining	2	1
Kitchen	1	1
Each bedroom	1	1
Breakfast	1	1
Breakfast nook	1	1
Pantry	1	1
Bath	1	1
Lavatories		1
Clothes closet		
Attic, with stairway (One outlet for each 300 sq. ft. or less)		1
Basement		1
Laundry	1	1
Garage, built in house	1	1

The Santa Cruz electric home not only complies with these minimum Red Seal specifications, but also exceeds them in that an electric range is actually installed, as well as an electric water heater, air heater, refrigerator, ironer, ventilating fan.

The home will sell for approximately $6,000; it was built by C. M. Blabon.

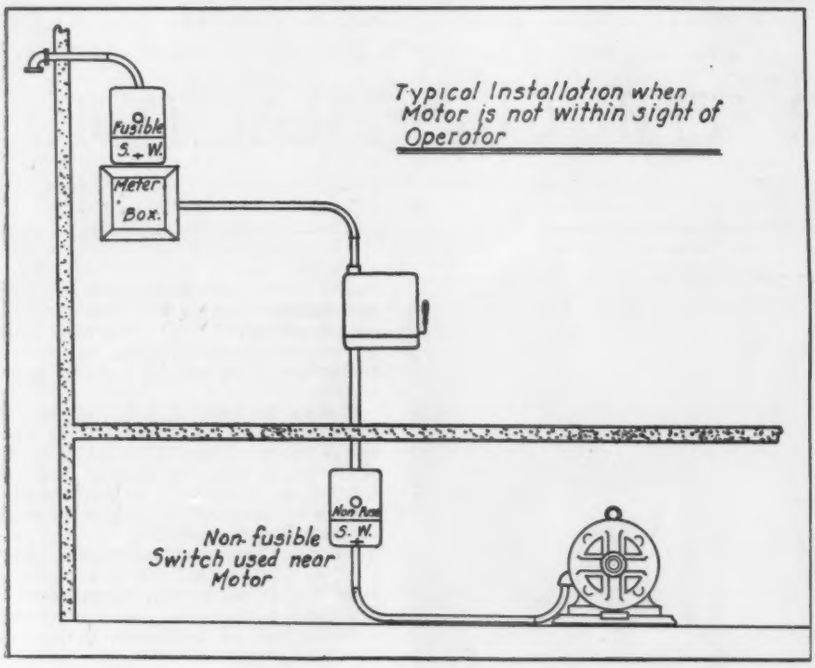

Typical Installation when Motor is not within sight of Operator
Fusible S. W.
Meter Box.
Non-fusible S. W.
Non-fusible Switch used near Motor

Fig. 2

Safety-First Installations for the Electrical Contractor

The May 15 issue of the Journal of Electricity (p. 370) contained a discussion of a single motor installation where all of the apparatus was in sight of the operator. This was the first of a series of five to appear in succeeding issues which will show five different types of installations commonly made by the electrical contractor.

Fig. 2 shows a typical installation where there is one motor installed but the motor is not within sight of the operator. It will be noted that as in Fig. 1 the service is brought directly to the fusible disconnecting switch just above the meter box and then to the starting equipment, thence down through a floor or through a partition into another room, to a non-fusible disconnecting switch and thence to the motor.

This enables the operator to make sure that the circuit is dead before he attempts to work on the motor, by having a disconnecting switch in sight of the motor; or, again he can work on the starting equipment and make sure that the line is dead by tripping the fusible disconnecting switch which is in plain view from the starting equipment. This at all times makes the installation safe from the operator's standpoint.

An Effective Electrical Message on Backs of Envelopes

The accompanying illustration shows the use made of the space on the backs of envelopes by the Great Western Power Company of California. The message is printed in bold letters which are very effective. It calls the attention of the reader to the fact that there is a reason for having an electric home and that he should have one.

Many people will read this that otherwise might not read the advertising urging greater electrification in the home. This is an idea which could easily be adopted by electrical contractors and would do a great deal to further the electrification of more homes.

MAKE YOURS

AN ELECTRIC HOME

There's a Reason

Advertisement on the backs of envelopes that conveys the idea of the electric home to the public

Modern Bakery Uses Electricity to Operate All Equipment

A complete electrical bakery recently has been opened by J. A. Sutten, proprietor of the Visalia Baking Company, at Second and N. Court Streets, Visalia, Calif. The pictures accompanying this article show the course of a loaf of bread through this modern plant, from the raw materials to the finished product. The first piece of apparatus is the blender, elevator and sifter into which the flour and other ingredients are placed. This machinery blends, elevates, sieves and weighs the flour. It next passes into the dough-mixer where the doughs are made. The tempering tank where the water is tempered and measured is situated above this. The water for tempering purposes is heated with a Wesix electric water heater. (See view 1, p. 97.)

After leaving the mixer the dough is placed in troughs where the proofing or fermentation process begins; then to the divider, which cuts the dough into small accurately weighed pieces for individual loaves. These pieces are transferred to the rounder by a belt conveyor. This machine rounds the pieces of dough before they enter the proofer. A system of conveyors connects the rounder to the proofer, where the pieces of dough rise to enable good moulding. From the proofer the pieces of dough enter the loaf moulder which shapes the pieces of dough for the pans; view 2. After being placed in pans, the dough is placed in the electric steam proof box where it leavens and rises before going to the ovens. The steam used in the proof box is generated by electricity, which is a recent development; shown in 3.

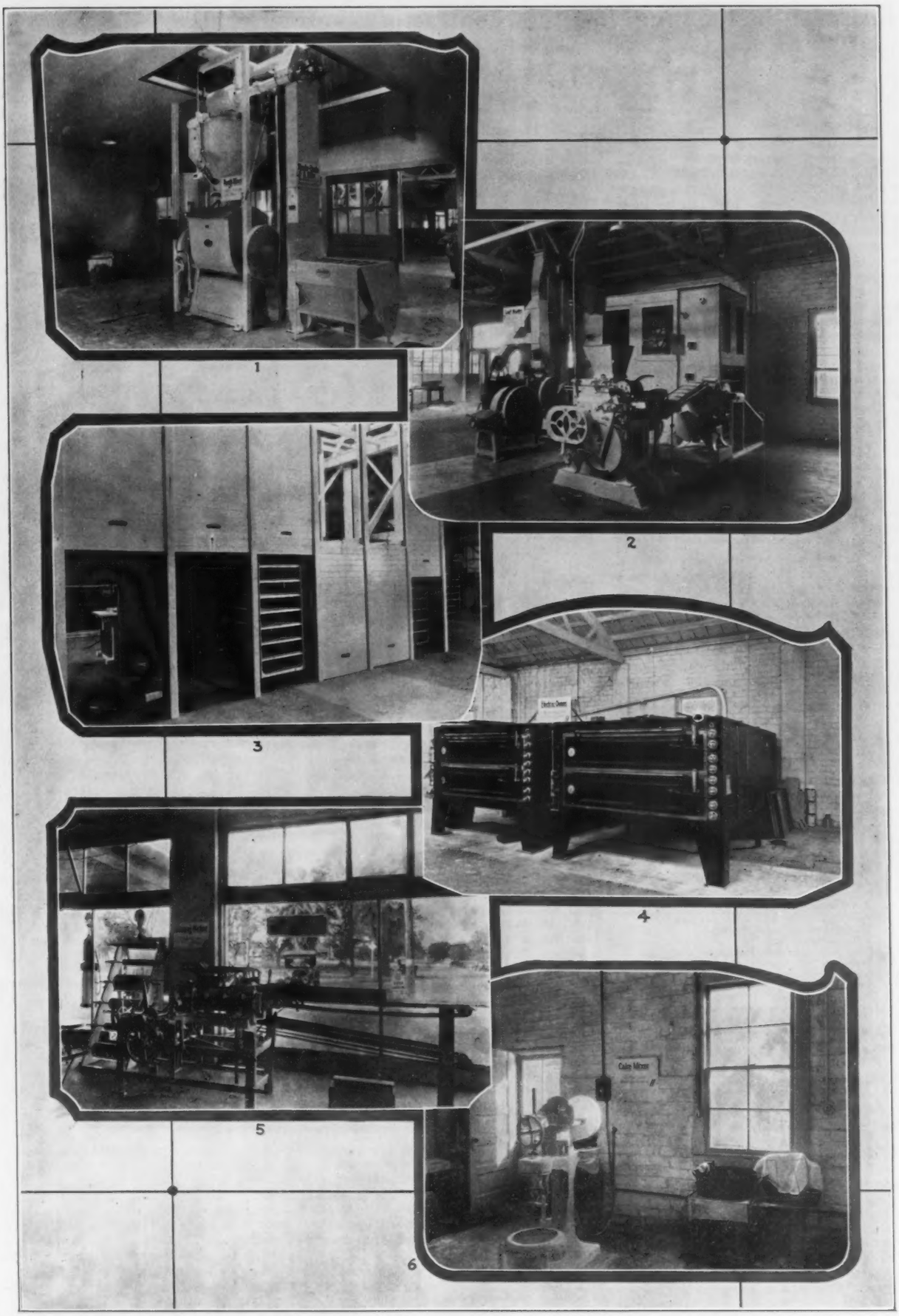
The pans then are placed in the electric ovens; there are two of these ovens of the two-deck, separate-compartment type constructed of heavy Armco iron. These are manufactured by the Rainier Electric Oven & Equipment Company of Seattle, Wash. Seven inches of block magnesia and air-cell covering surround the ovens to hold the heat. Three-phase 220-volt current supplies the ovens, which have a connected load of 45 kw. each. Each oven, shown in 4, is capable of baking 336 1½-lb. loaves of bread every thirty minutes.

The bread is wrapped in sanitary wrappers by an electric wrapping machine. Even the hot plates on this are heated by electricity. The machine, seen in 5, has a capacity of 1,500 loaves of bread an hour.

The cake mixer also is operated by electricity, as well as the heating unit in the doughnut kettle. View 6 shows this equipment. Since taking the pictures accompanying this article, an electric steam-generator has been installed to supply steam for the ovens to produce special crusts on certain kinds of bread.

A 400-amp. 220-volt main switch is required to serve the plant. Two 200-amp. 250-volt switches are provided for the electric ovens. Individual switches on the main board control the different groups of apparatus. Six motors have a total connected load of 15 hp. while there is 125 kw. of electric heating load. The electric work was installed by the Visalia Electric Works.

Electric cooking in the home is accepted, but people have just begun to realize that modern bakeries have used electric ovens successfully since 1918.



Electrical Estimating for the Contractor — II

A Medium-Sized Power Job Is Analyzed in This Article, the Second of a Series on This Subject

By J. R. WILSON*
Engineering Department, Los Angeles Electric Works

A contractor has a perfect right to inquire whom he is figuring against, and, if the competition is from a source which is known habitually to practice unethical methods, then the safest policy is to decline to figure the job. Sometimes the owner can be convinced that he is making a mistake in accepting the bid of an unscrupulous contractor.

Each installation is a problem by itself and usually will lend itself to several solutions. This is where the judgment and experience of the estimator will be brought into play to the fullest extent. An experienced estimator should be able to visualize the job and also to transmit this vision to the workman.

The man who can make the most efficient layout usually will get the contract. A thorough knowledge of "substitution of materials" is one of the greatest assets an estimator can have. This knowledge comes only through long practical experience in labor costs, and a constant study of trade journals, price lists, and quality of materials. A material or device that is cheaper in price, or erection cost, without sacrificing quality is the logical one to use. First cost is not the primary consideration, and each device should be considered carefully from a standpoint of efficiency. Usually an estimator's experience will tell him if a reasonable increase, in first investment, will mean a large saving in ultimate expansion cost. When this is so, the facts should be brought to the attention of the customer or should be included in an "alternate" in the bid.

Taking a medium size of power job as an example, and allowing that there are no plans or specifications prepared, let us proceed to analyze the job. The first step is to determine what preliminary information must be obtained, and the following items usually will represent the essential data:

1. Kind of current (a.c. or d.c.)
2. Cycles (if a.c.)
3. Voltage of supply
4. Total connected horsepower
5. Allowance for future expansion
6. Horsepower of each motor
7. Type of each motor
8. Type of each motor control equipment
9. Location of service entrance
10. Location of main switch and meter boards
11. Location of subpanels (if any)
12. Location of each motor
13. Location of each motor control
14. Type of machine each motor drives
15. Erection of motors and control equipment

In a new factory, if the owner has had to buy direct-driven machinery, he will have obtained the necessary information regarding items Nos. 1, 2 and 3 from the power company. If the motors have not been contracted for, or if it is a moving job or a "line shaft" job, the estimator should advise the owner regarding the kind of current available and the best types of motors for his particular installation.

Usually the power company will supply the kind of current desired if the horsepower demand will warrant the investment in service equipment. This applies to voltage of supply circuit. Of course if the power company's distribution system is alternating current and it is necessary for the customer to have direct current the customer usually will be required to furnish the motor generator set, or other converting equipment.

Item No. 4—total connected horsepower—must be ascertained through the customer. (In the articles to follow in this series full details will be given for figuring horsepower requirements for both individual machines of every type, and for group driving through line shafts.)

Item No. 5—allowance for future expansion—is usually one of the hardest problems that the estimator has to face. If he advises the customer to make a large allowance for future needs, the cost of the job is increased to such an extent that the customer immediately becomes suspicious. However, if enough capacity is not provided in the initial installation and the time comes that additional power is required, the necessary change will cost a great deal more money and usually results in expensive "shut-downs." In this respect the estimator is facing a hard problem, because usually the customer can see only the first cost.

The estimator should endeavor to locate the service switch and meter board as close as possible to the logical point of service entrance. The service wiring of course will be the largest wire and conduit on the job, and the shorter this can be kept the lower the cost of increase of capacity will be. With a main service run of around twenty feet the cost of doubling the capacity even 100 per cent, will represent a small amount of money, if made at time of first installation. Usually the greatest part of the cost will be represented by the main service switch. The cost of future capacity must be considered in the light of an investment spread out over a term of years. If in a certain installation it cost say, $200 to double the service capacity, and the customer should not need the added capacity until ten years later, it would represent only $32 per year as a "standby" charge, allowing 6 per cent interest.

If the proposition is put to the customer in the above light, he is usually a good enough business man to see the point, especially if the estimator also will explain that the charge at some future time probably will increase the cost at least 100 per cent. The writer is using the above method in his daily work and is getting excellent results.

Item No. 6—horsepower of each motor—must be known not only to figure the individual motor wiring, but also to figure size and capacity of service and sub-feeders. The code specifies that the service and feeders must be large enough to provide for the largest motor in the plant starting, when all other motors are running. (This will be discussed and more fully analyzed later in this series.)

Item No. 7—type of each motor necessary probably will have been determined by the supplier, or must be determined by the estimator. Usually the customer knows only that he wants to attain certain desired results and must depend upon the advice and honesty of the contractor to see that he gets value and efficiency. A full discussion on the different type of both a.c. and d.c. motors will be included in a later article.

Item No. 8—type of each motor control equipment—usually is determined by the code requirements regarding the horsepower of the motor or type of machinery driven. The code specifies that motors of 2 hp. or less do not require overload, or no-voltage, protection when driving only one machine. Motors above 2-hp. require both overload and no-voltage protection. On motors of 2 to 5 hp. this usually is provided by means of either hand-operated or automatic switches. On motors above 5 hp. of the straight induction type either manual or automatic compensators are provided. On the so-called "high resistor type," across-the-line starters usually are provided, regardless of horsepower. On machine tools and wood working machinery where the motor is not over 5 hp., it is the best practice to provide some type of "push button" switch. The switch should be placed in some location where it will be subject to the minimum of vibration and dirt. The button should be located at the most convenient point for the operator of the machine. On motors over 5 hp. it is good practice to locate the controller on a wall or convenient post or column and provide the machine or machines with "safety stop buttons."

Item No. 9—service entrance location—must be based upon the type of building, code requirements, future additions to building, location of main service switch, and location of nearest power supply. When the building sets "on the property line" some codes prohibit bringing the service wires out anywhere except on wall along street or alley or to point adjacent to fire wall on roof. The service conduit should be so located that it will not interfere with future building additions, and the customer should be consulted regarding his future building plans. The location of the main switch, based upon ultimate power demand, should be determined. Then the most direct run to a point conveniently accessible to available power supply should be chosen. If the installation costs do not outweigh the cost of additional conduit and wire for a longer run, the above location is the one to use.

Item No. 10—location of main switch and meter board—should receive the greatest possible consideration. The cost of the initial installation, and of future power additions, will be regulated to a great extent by the location of the main switch and meter board. Several factors must be considered: accessibility of switching equipment for quick repair and fusing, accessibility of meter for reading and testing, protection of meter board equipment against damage due to trucking, materials falling on, and being placed against it. Another very important factor for consideration is the distance to largest motors, or loads in the initial and future installations. Ample room always should be provided for future equipment. It usually develops that some change will be made when such equipment is installed.

(To be continued.)

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BETTER MERCHANDISING

Attractive Store to Stimulate Merchandise Sales

Utah Power & Light Company Occupies New Location Embodying Modern Ideas in Retail Establishment Layout

A variety of novel features, designed for the convenience of customers and the efficiency of the sales force, have been incorporated in the new store and division office of the Utah Power & Light Company in Salt Lake City. Through careful attention to detail this office, which is also the retail electrical store of the company from which it merchandises a large line of electric appliances, has been made a completely modern retail establishment. The store was opened to the public on March 2.

The new office and store occupies a ground-floor location that is much larger than the old site which was two doors to the north. It exemplifies every modern application of electricity in domestic service, as well as exhibiting the most recently developed ideas in store and window lighting. Though the large store room is brilliantly lighted at all times, no lighting fixture is visible, all being of the concealed type, hidden in artistic coves near the sparkling white ceiling and in ornamental urns on the large pillars inside the store. This new lighting system also enables the accounting department and other clerical employees to work without eyestrain and without the annoyance of shadows.

A floor of rubber tile gives the appearance of marble. This was selected on account of its resiliency, affording patrons and employees an unusual degree of foot comfort. The interior walls are finished in a restful gray, light enough to reflect the artificial light without glare. The woodwork is of mahogany. A large space is afforded for displays of washing machines, ironers, vacuum cleaners, floor and table lamps, ranges, and other domestic electrical appliances. For the convenience of customers comfortable chairs are provided for their use while making selections from the displays. An information desk is maintained to assist persons desiring to visit either the general offices of the company on the upper floors of the building or for those making other inquiries regarding the company's service. A well appointed rest room is found on the west balcony.

The new quarters provide increased counter space and additional tellers' windows for the greater convenience of patrons having business to transact with the application, service or accounting departments. The space given over to the accounting department is greatly increased over that of the former location. This increase was made necessary by the growth of the company's business handled by its Salt Lake City division offices.

Convenient to the front door are located the lamp counter and the office of the "Fix-it Shop" where customers obtain free repair service on appliances.

The division manager's office is located on the east balcony, reached by a broad stairway from the main floor. Another stairway leads to the basement demonstration rooms. Here an auditorium has been arranged for demonstrations of electric cooking and other domestic applications of electricity, as well as display space for many appliances not shown on the main floor. Salesmen's quarters, the "Fix-it Shop," stock rooms and storage vaults also are located in the basement. An interesting feature of the basement, though not intended as such, is the display of latest approved methods of inside wiring to meet the most rigid requirements of the Underwriters' code.

The show windows, consisting of an island window and large side and back windows, have installed in them the newest development in window lighting, which includes the utilization of color applications for heightening the display values of merchandise, as well as the most modern methods of using reflected and diffused white light. It is expected that the window lighting installation, while it was primarily designed to display the company's own merchandise advantageously, will be regarded as a demonstration of correct window lighting by merchants who are studying lighting methods.

Ample space, attractive and well appointed interior design and arrangement, embracing the most modern and up-to-date features, make the Utah Power & Light Company's new store one of the finest in the West.

BE A DUMB GLUCK AND MAKE A MILLION

By JOE OSIER

When Christopher Columbus first conceived the idea that the world was round and that—

The land of the free and the home of the strap hanger was but a few days' row away—

The Wise Williams, including taxi-drivers, hat check brigands and the boys who bought only bonded warehouse stuff,—

Figured Chris was on the trail of a melancholy bug—that he was light under the lid and—

They avoided him as though he were an income tax collector or an assessor or an insurance solicitor, for instance.

But history tells us, Columbus laughed 'em off. He didn't expect that gang to play Iron-Handed Ernest to him. Anyway, why should he fret? He was playing four aces pat and holding a Queen for a kicker, and he was sitting behind a stack of Royal jools.

Well, it is current gossip that he accomplished—I'm not telling anything new. But here is the point:—

Today, as in 1492, when a man springs a revolutionary idea, the wiseacres point fingers at their dumb domes, make funny clucking noises and smart cracks and allow—

That it is all right to talk to oneself provided one does not answer.

Now take the case of an Electrical Contractor-Dealer I know. Because he thinks satisfied customers are better

Do you belong to the coo-coo chorus?

than bullion in the bank; because he insists on service first and profit afterwards, he has been dubbed Dumb Dan but—

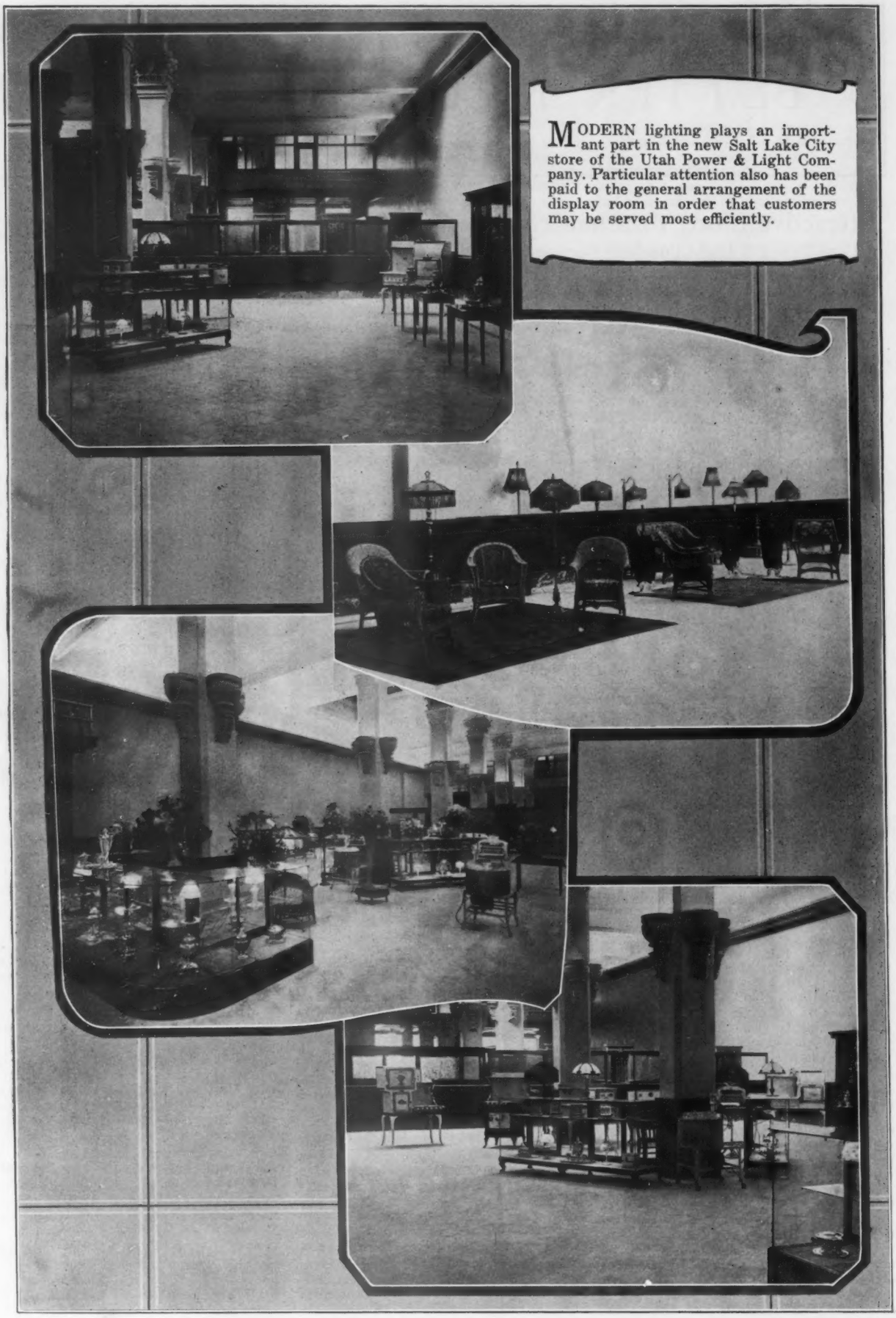
I have often noticed that his store doors are always open with folks going in and out.

The Wiseheimers say Dan is dumb because he thinks: "Getting By will insure Getting Sunk": because he says "The customer is always right;" because he will not connive with the other bidders nor will he cut his original bid and —

Because he merchandises only the best and stands back of his bargains.

They say he is dumb—that he is one-way traffic in a one-way town and Dumb Dan—

Says nothing. With his four aces pat and his Queen for a kicker, he goes about his business of discovering America. And he plans on building a gold fence around it.



MODERN lighting plays an important part in the new Salt Lake City store of the Utah Power & Light Company. Particular attention also has been paid to the general arrangement of the display room in order that customers may be served most efficiently.

Getting Personal Interest in the Electric Home

San Diego Electric Club and Junior Chamber of Commerce Stimulate Desire for Home Electrification

By W. A. CYR

Something new has entered into the latest model electric home being displayed in San Diego by the Electric Club in conjunction with the Junior Chamber of Commerce of that city. The new element is not one of equipment nor appurtenance. It is a new angle of view, a new sense of individual interest in the home expressed by the 20,000 people who have viewed it.

In the past, electric homes have been put on display, and thousands have gone through them from a mild sense of curiosity and an impersonal interest in the latest developments in home applications of electricity. Such developments being more or less familiar facts, the injection of a deep personal interest in an electric home is the more remarkable.

This revived interest was no calculated thing. It was purely accidental in this case, and the method of exploiting and disposing of the home was responsible for it.

Desiring to raise a fund for its activities, the Junior Chamber of Commerce of San Diego proposed to the Electric Club the sponsoring of an electric model home, which the chamber could dispose of through tickets to be sold to the public, one of which would entitle its possessor to the home at the end of the contest. The Electric Club was to plan the electric installation, equip the home electrically and provide demonstrators to show the public the uses of electric appliances.

It is this that has brought from the public the personal interest. Every buyer of a ticket for the home immediately has assumed of his own accord a direct personal interest in the building. The home **might** become his some day, and, therefore, he is keen to note its every particular.

So general is this idea that practically every visitor to the home may be heard making remarks, half jokingly but with an implied seriousness, about what he or she will do with this room and that room when the home is his or hers. Since the furnishings are not to be given with the home, lively discussions of how the visitor's furniture and effects will fit into the home are a common occurrence.

Many visitors, imbued with this personal sense of ownership, have not been content to visit the home once and let it go at that. They return to revisit and to speculate again on the thought of living in the beautiful home. Some few, more enthusiastic than the rest, revisit the home practically every day.

Naturally the value of this interest from an educational standpoint is immeasurable. Every electric appliance, every electric convenience, is looked upon as a personal possession, without which the individual will feel a definite loss, later. And while some of those whose hearts are most set upon the home are sure to be disappointed, the desire aroused for the electric home is sure to reflect in more complete electrification of their own homes, perhaps in the building of other homes incorporating some of these most desired conveniences.

If such is the case, much good can spring from the new San Diego model electric home, those in the city feel, for the home is a complete and well planned electrical domestic achievement.

Its major electric features are to be found in the refrigerator and the heating system, which are both electric. The refrigerator is a large, enamel-and-nickel-finished unit, permanently installed in the wall of the kitchen, its face extending beyond the wall of the kitchen but two inches. It, of course, includes a double ice-making chamber, a large food storage chamber, and has the mechanism concealed in the lower chamber near the floor. The convenience of the refrigerator is demonstrated in its accessibility and the fact that there is no necessity for stooping.

The electric heating system, for which a separate closet was built, is of the hot-water circulating type. The water is heated and thermostatically controlled by electricity and is circulated throughout the house by a standard system of radiators. Beside this an electric water heater was installed to provide hot water for bath and kitchen. The refrigerator, the heating system, and the electric water heater are to be given with the house.

Other electrical features put on display included the usual list of household appliances, range, washing machine, vacuum cleaner, cake mixer, ironer, percolator, toaster, hair dryer, tumbler heater, as well as an electrically operated grand piano, which proved a revelation to many visitors to the home.

The only difficulties encountered have been those of administration. A delay in the finishing caused a postponement of the exhibit, and consequently of the giving of the home. A second postponement of the giving of the home was necessitated because the ticket sale had not reached the goal set by the Junior Chamber of Commerce necessary for a satisfactory settlement to all concerned. A revised campaign for ticket disposal promises to put the ticket sale, which had reached the 10,000 mark July 15, to the required 15,000 by Aug. 1.

From an electrical and educational standpoint, the method seems to commend itself to adoption by other communities. The keen personal interest in the home that has come as a natural by-product of the method of disposition has high potential value educationally to the industry. That it came about by accident and not by design proved a welcome surprise to San Diago electrical men. But its effects being known, other projects of this sort might well be directed to still greater benefits.

Kitchen and living room of the San Diego Electric home, which, because of the manner in which it was displayed, became a matter of personal interest to each visitor. Note the electric refrigerator permanently installed in the kitchen

To dramatize the utility of the electric vacuum cleaner, A. B. Spencer, during a special sales campaign of the Public Service Company of Colorado, used the four displays shown here. Each act appeared in the principal show window of the company's Denver office and was allowed to remain for a period of one week. By using cards carrying the synopsis of the four-act "play" the public was kept informed as to the sequence of the "plot" of the production. As will be noted from the illustrations, all of the characters, with the exception of the villain and his accomplice, were impersonated by vacuum cleaners. The villain and his aide were represented by a carpet sweeper and a broom. The hero, V Dollars—the down payment being featured—returned the heroine to his home.

NEWS OF THE INDUSTRY

Utility's Suit Against Railroad Commission Dismissed

Sustaining the contention of the California Railroad Commission in the action brought against it by The Southern Sierras Power Company, Judge Paul McCormick of the Federal District Court for the southern district of California on July 16 granted the motion of the commission's attorneys to dismiss the suit brought against it by the power company. The suit, which questioned the matter of the commission's jurisdiction and operation, represented the most important attack upon the Railroad Commission made during the last few years.

The company, which operates in the eastern and southeastern portions of the state, asked the federal court to annul two orders of the Railroad Commission, one of which fixed rates to be charged for electric service upon its system, and the other denied an application for temporary rate increases. The court was asked to enjoin the Railroad Commission from enforcing the collection of the present schedule of rates upon this system and also to enjoin the Railroad Commission and all other persons from interfering in any way with the collection of a proposed new schedule of rates 10 per cent higher than the existing rates, save in certain territory in and around San Bernardino, where this company operates in competition with the Southern California Edison Company.

The Railroad Commission, through its attorneys, moved that this complaint be dismissed upon the ground, among other things, that the federal court did not possess jurisdiction to grant the relief asked in this complaint, and upon the further ground that the plaintiff should exhaust its remedies under the state law before going to the federal court. The commission also took the position that since the utility voluntarily itself had reduced a large number of the rates fixed in the commission's order, this company properly could not attack these rates in the federal court. This position was sustained by Judge McCormick. It is not known whether an appeal will be taken by the company.

Customer-Ownership Campaign in Denver Sells 9,100 Shares

More than 9,100 shares of preferred stock of the Public Service Company of Colorado and Cities Service Company were sold in the fourth customer-ownership campaign of the former company that closed recently. In the eleven days of the campaign, according to a report of Guy W. Faller, vice-president of the company and in direct charge of the activity, 8,612 shares of stock were sold by employees and about 500 shares by the securities department.

The results compare favorably with the first campaign when a record number of shares was sold to customers throughout the properties of the company, including its subsidiary at Cheyenne, Wyo. Even in Denver where the company recently was refused a franchise extension until a later election a record number of shares was sold.

Jack Barker, purchasing agent of the company, and his department led in sales, both as to total shares and the highest average per man. Winifred Ralston of the publicity department won the prize for women employees by placing 66 shares. Outside of Denver the Fort Collins office topped the state properties, while C. J. Hancock, manager of the Clear Creek district with headquarters at Idaho Springs, reported high individual sales of 200 shares. The next customer-ownership campaign will be conducted in November.

Delivery of Hetch Hetchy Power Scheduled for July 31

Delivery of power from the Moccasin Plant of the City of San Francisco's Hetch Hetchy development to the Pacific Gas and Electric Company was scheduled to start July 31, according to reports received from the power house on July 28. Two of the four 20,000-kva. units will be put on the line to start with, and it is hoped that the others may be in service by Aug. 12.

The damage to two of the penstock lines that was brought about by an operating error on June 30 (Journal of Electricity, July 15, 1925, p. 66), was repaired, and on July 23 water was turned into them for tests. A small leak near the surge chamber developed in one of the lines, necessitating the unwatering of the penstock. This leak was repaired and on July 28 water was again turned into the two lines. Plans on that date provided for a three-day drying-out period before the units were put on the line supplying power under the contract between the city and the Pacific Gas and Electric Company.

The repairing of the other penstocks has been a little more difficult. Indications are that the third and fourth units will not be ready for service prior to Aug. 10.

Pasadena Plant to Burn Natural Gas.—The Pasadena municipal light and power department is installing gas burners under the boilers in the steam plant to replace oil burners now in use. Since natural gas can compete very favorably with fuel oil at $1.18 or more per barrel, it is expected that this change will save the city a considerable sum each year. Los Angeles Gas and Electric Corporation has contracted to furnish one year's supply of natural gas and is speeding up work on a pipe line to carry this fuel to the city's station. Consumption will approximate 3,000,000 cu. ft. of gas per day.

New High-Tension Crossing to Be Constructed by B. C. Utility

Permission to construct a high-tension crossing of the Second Narrows, Victoria, B. C., has been requested of the Dominion Department of Public Works by the British Columbia Electric Railway Company, Ltd. Specifications for the line, which will be carried on steel towers, are being prepared. The tower on the north shore will be 300 ft. high, and that on the south shore 150 ft. high. In addition to the two main towers there will be three heavy anchor towers. The cost of the work is estimated at $60,000.

The new crossing is necessitated by the fact that the Dominion Department of Public Works notified the utility company that its lines must be removed as they were in the way of dredging operations. The towers to be installed will carry two lines, there being a third one across the inlet at Barnet.

Storms Do Little Damage to California Systems

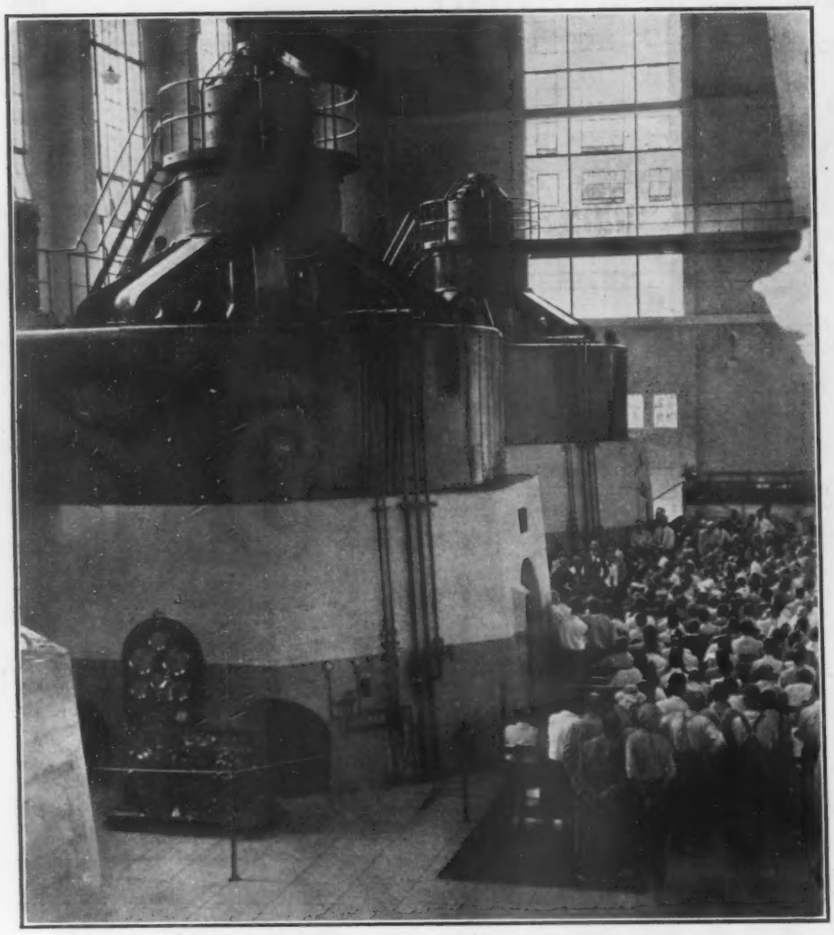
Temporary interruption to the service to the cottages and tents around Huntington Lake, in central California, was reported by the Southern California Edison Company due to the high winds which occurred in that vicinity July 14. Damage was very slight and was confined entirely to distribution lines serving resorts around the lake. Construction equipment was unharmed by the storm, and the high-tension lines furnishing power for the camps back of Kaiser range were not affected.

None of the major equipment of the San Joaquin Light & Power Corporation in the San Joaquin Valley was damaged in any way. A few poles and small transformers were lost due to lightning.

Progress Report on Balch Plant of San Joaquin Company

A progress report of work on the Balch Plant of the San Joaquin Light & Power Corporation, Fresno, Calif., states that the two-mile road from Balch camp to the power house site has been completed and the 7,000 ft. of road to Williams Crossing has been cut through to Farnham dam site. The penstock site has been cleared of brush and trees, and incline equipment from Kerckhoff dam will take care of construction work on that part of the project. A sawmill is also in operation. Preparations are well under way for the 19,550-ft. tunnel from Williams Crossing to the power plant, the work to be superintended by Ed. ("Tunnel") Fox.

A description of the Balch plant was published in the Journal of Electricity, April 1, 1925, p. 241.



Interior of Pit 3 power house, showing two of the three units, during the dedication ceremonies.

Pit 3 Is Dedicated Officially and Put in Service July 18

Formal ceremonies, to dedicate and place in operation Pit No. 3, the fourth hydroelectric plant of the Pacific Gas and Electric Company on the Pit River in northern California, were held on the afternoon of July 18 in the new power house. The dedication, under the chairmanship of Frank A. Leach, Jr., vice-president and general manager of the company, was witnessed by two hundred and fifty editors, engineers and company employees from northern and central California who were the guests of the company on a three-day excursion which started from San Francisco July 17.

Pit 3 power house is located on the Pit River 11 miles below Pit 1, which was placed in operation three years ago. The new plant contains three 33,000-hp. vertical reaction turbines operating under a head of 280 ft. and direct connected to three 27,000-kva. generators. Power is stepped up to 220 kv. through three banks of 30,000-kva. transformers and is transmitted over an 8-mile extension to the original 220-kv. lines leading from Pit 1 to Vaca-Dixon substation and thence over these lines to the lower end of the Sacramento Valley, a distance of 200 miles. The Pit 3 development was completed in twenty-three months at a cost of $13,500,000. Complete details concerning the hydraulic and electrical features of the project will be presented in the Aug. 15, 1925, issue of the Journal of Electricity.

The Pit 3 Dedication Trip

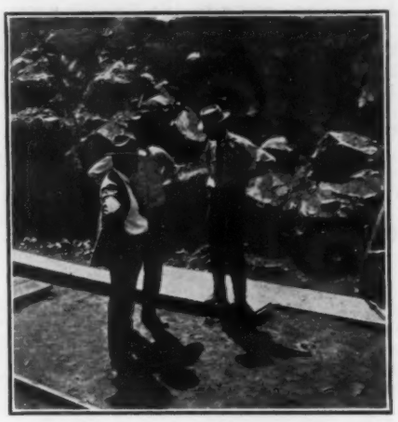
The party invited to be present at the dedication ceremonies was transported to Mt. Shasta City by a fourteen-car special train and thence over the McCloud River Lumber Company's railroad to Bartle. The 35-mile trip from Bartle to the power house was made over the Pacific Gas and Electric Company's construction railroad, the party arriving at 4 p.m.

The dedication ceremonies commenced at the power house as soon after arrival as possible. Mr. Leach in his opening remarks gave a brief description of the work involved in the harnessing of that portion of the Pit River involved in the Pit No. 3 development, and then introduced A. H. Markwart, vice-president in charge of engineering. Mr. Markwart gave a brief summary of the engineering features of the project and paid tribute to the various chiefs of design and construction in his department. P. M. Downing, vice-president in charge of electrical construction and operation, discussed briefly the problems incident to that portion of the work coming under his jurisdiction, giving credit to the splendid performance of his department managers.

The first unit was started by Miss Bernice Downing, editor of the Santa Clara Journal. The second unit was started by E. C. Hutchinson, vice-president and general manager of The Pelton Water Wheel Company, and E. O. Shreve, San Francisco district manager of the General Electric Company.

Following the dedication exercises, the guests spent an hour inspecting the switchboards, outdoor bus structure and the plant itself. The party then was taken to Pit 3 Camp where, after dinner, they gathered to hear more of the details concerning the Pit River development. Mr. Leach introduced R. E. Fisher, vice-president in charge of public relations and sales, as chairman of the evening. Moving pictures showing the progress of the work on the development were presented to give a pictorial story of the project. Mr. Markwart, the first speaker, gave a full discussion of the engineering features involved in the design and construction of the Pit River Development. Mr. Downing, speaking next, delivered a discussion, illustrated by lantern slides, that presented graphically the topographical conditions entering into the company's plans for the development of the river. Among the other speakers who addressed the visitors were: Harris J. Ryan, professor of electrical engineering, Leland Stanford, Jr., University; C. L. Cory, dean of the college of mechanics, University of California, and Irving Martin, former member of the California Railroad Commission, who discussed the responsibilities of the company in connection with furnishing service to the public. Mr. Martin spoke concerning the need for cooperation between power and irrigation interests so that the greatest good might come from the use of the water resources of the state.

On Sunday morning the dedicatory exercises for the storage reservoir formed by the Pit 3 diversion dam were conducted. C. P. Cutten, of the legal department of the company, delivered an address eulogizing the late John A. Britton and in honor of him named the body of water "Lake Britton". O. W.



P. M. Downing, vice-president in charge of electrical construction and operation; O. W. Peterson, engineer of general construction; and G. M. Wherle, in charge of Pit 3 construction, look over some of the work that has been completed by their company.

Peterson, engineer of general construction, gave some of the technical details concerning the construction of the dam which impounds a lake nearly nine miles long.

This closed the formal part of the excursion. The guests left the Pit 3 Camp at 2 p.m., arriving at Mt. Shasta City at 6:30. The special train was boarded

Frank A. Leach, Jr., one of the editors on the trip, getting the story of Pit 3 from J. Charles Jordan. (Mr. Leach, by the way, is vice-president and general manager of the Pacific Gas and Electric Company).

there and the return to San Francisco was started, the party reaching the city at eight o'clock Monday morning.

The entire excursion was organized admirably and nothing was omitted that might make for the comfort of the guests. Despite the fact that the trip

The mess hall at Pit 3 Camp was one of the most popular places.

was made during an exceedingly warm spell, arrangements made beforehand provided maximum comfort for the party. Mr. Fisher was responsible for all of the arrangements, and was assisted by practically all of the division and district managers and many of the local agents of the company.

Pacific Company Issues Booklet for Public Relations

As a new step in the public relations work of the Pacific Power & Light Company, Portland, a twelve-page booklet, 4 x 8 in. entitled, "Introducing Pacific Power & Light Company", has been issued for the purpose of handing or mailing to every new customer as he applies for service. Its attractive make-up invites reading, for with its eleven illustrations of company properties interspersed through its 775 words of reading matter it presents to the eye an appeal not easily disregarded.

Stating the reasons for the distribution of the booklet, under the first heading "Introducing Our Company to You", it says: "If you were opening an account with a strictly merchandising establishment you would be able to form a rather accurate idea of the sort of business it was by a personal inspection. A personal inspection of our plants and service facilities would mean hundreds of miles of travel and is, of course, impracticable." The booklet then proceeds under the next heading, "Interesting Facts", to tell something of the company's properties, and continues with short discussions of the following subjects, "Finances and Ownership", "How We Measure Your Service", "Electrical Merchandise", "State Regulation", and concludes with "Our Ambition: To Serve You Well". The center double-page spread is given over to a map of the company's system.

Southern Sierras Company Gets Pumping Power Contract

The Southern Sierras Power Company, Riverside, Calif., has contracted to furnish power to operate pumping plants for a new irrigation district in Lower California being opened by the Delta Canal Company of Calexico, Calif. The known territory in which underground water may be pumped in sufficient quantity for irrigation purposes covers an area twenty miles long, ranging in width from three to six miles. Approximately 200,000 acres of cotton-growing land, for which gravity water from the Colorado River cannot be used because of location, will be made available through this development.

Comparative costs of central station with Diesel engine power were carefully analyzed, and, though it is necessary to transmit the power a distance of over 500 miles from generating plants in Inyo and Mono Counties, the former was decided upon as the more efficient and economical.

General Electric Company Chairman's Address on New York Farm Electrification Published.—The address of Owen D. Young, chairman board of directors, General Electric Company, delivered in Albany, N. Y., before a meeting of representatives of farm, university and electric public utility organizations under the auspices of the Empire State Gas and Electric Association, has been published in pamphlet form. The subject of the address was "Farm Electrification in New York State." In it Mr. Young told how the farmer, the power company, the manufacturer, and the state could cooperate to bring about farm electrification in the state.

Lighting Educational Committee Presents Final Report

The final report of the Lighting Educational Committee, giving a tabulation of the results of the Better Home Lighting Contest, has been published. The 40-page booklet contains a full report of the activities of the committee from the time that the purpose of the contest was defined until the final awards were made to the school children winners.

The organization of the campaign, methods of reaching the children, statistics detailing the coverage secured, financial scheme employed and a discussion on what the Primers revealed, are among the interesting subjects covered in the report. General comment in regard to the effectiveness of the campaign, together with reports from the regional directors is extremely interesting.

In discussing the basis for future activity, J. E. Davidson, chairman of the Lighting Educational Committee, reaches the following conclusion:

> The work the Lighting Educational Committee undertook in this movement has been completed, but the work of the industry has just begun. It should be evident to everyone that, through this great educational activity, we have assumed a new obligation to the consuming public—an obligation which can easily be met without financial sacrifice, and one which must be met if we are to foster and develop the goodwill and friendly public relations resulting from the contest. The electric lighting industry must make it easy for the user of light to secure types of equipment which will provide the proper lighting described in the primer and approved by the industry as a whole. It must encourage the use of such equipment by precept and example as well as by sales policies and by sales effort; it must keep faith with the public.
>
> The task of fulfilling this obligation has been left in the hands of a great industry and a strong army of individuals—men with foresight and vision and perseverance. The industry is already at work, and the public will benefit from a real lighting service.

Copies of the report have been sent to a limited number of persons and companies. There are a few additional copies that may be secured by addressing the Lighting Educational Committee, 29 West 39th Street, New York City.

Pump Standards Published by Hydraulic Society.—Recommended standards of engineering in the pump industry as set forth in the recently published booklet (third edition) of the Hydraulic Society should do much to assist both the manufacturer and the user of this equipment. The publication is quite complete, covering accepted principles of business conduct as adopted by the society, classification of pumps, nomenclature, definitions, service recommendations, installation instructions, motor ratings, friction tables and general information. Copies of this 34-page booklet may be obtained from any manufacturer who is a member of the Hydraulic Society or from the secretary, C. H. Rohrbach, 90 West Street, New York City.

Westinghouse Awarded Contract for Steamship Equipment.—The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been awarded the contract for installing four 300-kw. turbo-generator sets, 500 12-in. stateroom fans, and 90 motors, 56 of which are watertight, on the steamer Malolo now being constructed in the East for the Matson Navigation Company, San Francisco.

Nine Merchandise Sales Programs Prepared by Pacific Gas and Electric Company

Nine complete sets of sales plans, detailing the methods to be followed by the Pacific Gas and Electric Company in its campaign to place 150,000 hp. of load on its lines in the next six months (Journal of Electricity, July 1, 1925, p. 33), are being prepared by the company for distribution to manufacturers, jobbers and dealers interested in the sales program of the company. The bulletins cover the company's plans from the announcement and aims of the campaign to detailed information concerning the methods of making and completing sales.

A separate sales program has been prepared for each of the following classes of merchandise; ranges, water heaters, kitchen lighting units and lamps, air heaters, store and window lighting, industrial lighting, industrial heating, and commercial heating and cooking. The purpose of the bulletins is to acquaint the merchandising branches of the electrical industry with the features of the sales program that has been adopted and to offer these branches of the industry the fullest opportunity to cooperate with the company to the advantage of all. Active participation in the campaign planned is desired by the central station, which also intends to offer manufacturers the opportunity to hold meetings of sales forces to acquaint the salesmen of both the company and any dealers who cared to attend with the important selling points of the manufacturer's line.

The plans covering the entire list of current-consuming devices covered in the sales program provide in general that the company will stimulate the sale of these both through its own specially recruited sales force of 200 men and through dealers by assisting them in the selling and financing of the merchandise.

Sales plans for the merchandising of electric ranges, water heaters, kitchen-lighting units and lamps, and air heaters, have been prepared and will be mailed to interested persons in the near future. While all plans are made for each particular class of merchandise and are governed by different conditions, the first three will give a general idea of the sales drive organized by the company.

Range and Water Heater Plans

The company plans to place 4,000 electric ranges and 2,000 electric water heaters on its lines before the end of the year. To do this it will employ about thirty additional salesmen to cover its territory. In addition, electrical dealers and a few large household furnishers have been given the opportunity to cooperate with the company by selling ranges under three distinct arrangements.

The three dealers' sales arrangements will be offered according to the classification made of the dealer by the local division sales manager. The arrangements for the three classes which are defined are as follows:

Class 1. Dealers who display continuously in a prominent position on the sales floor five electric ranges, of the same or different makes, one water heater and one air heater; and in addition advertise this merchandise regularly.

The company will sell these dealers electric ranges and water heaters at a very low price. These dealers may secure the purchase order for themselves and get the customer to sign the installation term contract furnished by the company according to the fixed schedules, collecting 10 per cent of the installation term price. This installation term contract with the down payment then may be turned over to the company which will arrange for the installation of the equipment. If the dealer prefers, he may pay the installation cost to the company which will arrange for installation, allowing the dealer to handle the entire transaction with the customer.

Class 2. Dealers who do not meet requirements of Class 1, but who carry ranges purchased either from jobbers or the power company.

Jobbers will be able to sell these dealers at a price less than that offered by the company. Installation arrangements are the same as for Class 1.

Class 3. Dealers who carry no stock of ranges or water heaters but who make sales.

These dealers will be supplied with Pacific Gas and Electric Company purchase contracts. On selling a range or water heater to a Pacific Gas and Electric Company consumer, the dealer will collect 20 per cent of the installed term price and will turn this over to the company with the contract. In return he will receive as commission 20 per cent of the cash price of the merchandise. If he is a contractor also he may submit an estimate on the cost of installing the equipment. If the estimate is considered correct by the company's inspector he will get the job without competition; if not, the work will be open to bids from three contractors. If the purchaser is not receiving electric service from any power company the purchase contract must be accompanied by a contract for electric service taken from the Pacific Gas and Electric Company.

Sales made directly by the company will be handled by the regular water heater and range salesmen and the special sales force of thirty. To prepare the way for these men, advertising in local papers will be used as well as direct-by-mail broadsides. These broadsides will reach the prospective customer three days prior to the call of the salesman. In preparing the prospect list the company will use its "meter route stencils" and will regard every domestic consumer with an average monthly lighting bill of $3 or more as an excellent prospect for an electric range and water heater. Sales will be made either for cash or on a small monthly installment contract covering both the cost of the equipment and installation. A 10 per cent discount will be allowed for cash. If an order for a range is secured by a dealer cooperating with the company, the salesman will receive the same commission as if he had made the sale. This will secure cooperation between dealer and company salesmen.

Installation Arrangement

The installation arrangement prepared provides that the company will handle all of this, at fixed prices, whether the equipment is sold by a dealer or company salesman. The installation prices as set are as follows:

Territory 1.—This territory includes the incorporated cities of San Francisco, Oakland, Berkeley, Richmond, Emeryville and San Leandro.

	Terms.	Cash
Range only	$60	$54
Range and water heater	80	72
Water heater only	30	27

Territory 2.—All other territory served by the Pacific Gas and Electric Company.

	Terms.	Cash
Range only	$40	$35
Range and water heater	60	54
Water heater only	30	27

These schedules apply where the cost of installation to the company does not exceed $100 for the installation of the range, $130 for installation of range and water heater and $40 for water heater only, in Territory 1; and $80 for range, $110 for range and water heater and $40 for water heater in Territory 2. In exceptional cases where the cost would exceed these figures the customer would be asked to pay the amount over the maximum allowance.

Installation of all of this equipment will be handled by contractors operating on the company's system. Bids for each installation will be requested of three contractors, the lowest bidder to receive the work. The contractor will be paid by the company.

Kitchen Unit and Lamp Sales Plan

The program for selling 20,000 kitchen lighting units calls for the use of about ninety specially trained company salesmen and the sale of this equipment through electrical dealers in the company's territory. Company salesmen will be assisted by prospect cards made out in the consumer's name. Each salesman will take about 30 of these cards, covering that number of prospects in close proximity to each other and will be expected to interview them during the day. In addition to making an effort to sell one of the units, the salesman will endeavor to get information regarding the number of appliances in use in the home visited. These cards will be returned to the local office of the company and the information that they contain will be used later in the sales campaign. Upon sanction of the division sales manager other members of the merchandising branch of the electrical industry will be permitted to make use of the information secured in this manner.

Where prospects cannot be sold one of the kitchen lighting units the salesmen will endeavor to sell a 100-watt lamp for lighting the kitchen. Results obtained by other central stations in kitchen unit campaigns have indicated that one of each ten prospects interviewed purchased units while seven of the ten purchased lamps of larger wattage. The kitchen units offered are of two types, one with a combination convenience outlet and switch, the other with no switch. The first is listed at $7.50 installed with 150-watt lamp; the second, installed with the same type lamp, $6.50. These prices are on a term contract providing that the unit is to be sold with no down payment and paid for at the rate of $.75 a month, this amount to be added to the lighting bill. If cash is paid for the unit, a 10 per

cent discount is allowed. Lamps purchased will be charged on the consumer's next monthly lighting bill.

Contractors to Install Units

Installation of the units will be by contractors, selected as nearly as possible from the neighborhood where the unit is to be placed. In order to secure the best results from the campaign, the company feels that the units must be installed within twelve hours after the order has been taken. This fact will be considered when appointing the contractors to install the units. If the neighborhood contractor can guarantee to install them within the twelve-hour period, he will be given the work and will be paid at the rate of $1 per unit hung. If this cannot be guaranteed by the neighborhood contractor, the company will be forced to go outside of the district to secure someone to hang the fixtures.

Dealers' cooperation in the selling of the kitchen units is to be secured by the placing in the hands of those desiring to sell the units a stock which will be on consignment. These are to be displayed by the dealers and are to be used as samples. When the dealer secures an order for one of the units from a Pacific Gas and Electric Company customer, he will have the consumer sign one of the company's purchase orders. This order will be turned over to the local office of the utility and the dealer will receive a commission of $1. He then can install it and get the $1 allowed or the company will attend to the installation and collection of the purchase price.

Present Activities

At the present time thirty special salesmen of the company are developing range and water heater sales in the San Francisco Bay region. Their efforts have met with considerable success in the first two weeks that they have been soliciting in a house-to-house canvass. Ninety men are working on the kitchen unit and lamp sales campaign in San Francisco and the territory north of the San Francisco Bay. As soon as this region has been covered completely the salesmen will be moved to another section of the company's territory.

The Great Western Power Company is cooperating with the Pacific Gas and Electric Company under the same program as given above. The quotas established by the Great Western Power Company are given on this page.

California "Dirt" Farmer on Railroad Commission

Leon O. Whitsell, a farmer of Orange County, Calif., has been appointed by Governor Friend W. Richardson a member of the California State Railroad Commission, succeeding Egerton Shore, resigned.

In making the appointment Governor Richardson said in part:

"I am selecting Leon O. Whitsell as Railroad Commissioner because he has the necessary ability, vigor and integrity for this important position; because he is a real 'dirt' farmer, with a farmer viewpoint; because he has the legal learning needed to cope with the commission's problems, and because he comes from the southern portion of the state. Mr. Whitsell lives on a farm in Orange County, has been prominent in farm circles, and is intensely interested in agricultural problems."

Electric Truck Enthusiasts Meet In Portland

In a spirit of cooperation, and with a view to seeing what could be done to proomte an interest in the use of electric trucks in Portland, seven men representing the two power companies, the storage battery companies and the truck companies met for an informal dinner, July 10, in that city. General conditions affecting the operation of electric trucks and the field for their use were discussed. No permanent organization was formed, but the meeting adjourned with the intent of commencing again early in the fall to organize a definite program of promotion, it being generally conceded that a promising field exists in Portland.

Leaders in the movement were: H. E. Cowgill, Commercial Truck Company; J. D. Sinnot, Exide Storage Battery Company; J. D. Scott, Commercial engineer, Portland Electric Power Company; A. L. Apperson, power salesman, Portland Electric Power Company, and R. W. Faville, sales engineer, Northwestern Electric Company.

New Illumination Process to Be Used by Los Angeles Firm

Manufacture and installation of electric signs utilizing a new process of illumination, developed from the liquidation of the rare gases extracted from the air, will be the aim of a corporation recently formed in Los Angeles. The company is a consolidation of the Electrical Products Corporation of that city, and the Claude-Neon Lights. Prominent financial interests of Los Angeles also have entered into the organization of the company.

The new concern will retain the name of the Electrical Products Corporation and will specialize in standard types of electrical signs as well as theater lighting, outdoor and indoor illumination. Paul D. Howse will retain presidency of the company.

Exclusive sales rights for Claude-Neon products for all territory west of the Rocky Mountains, including the state of Colorado, are held by the newly organized company.

Great Western Announces Quotas in Power Sales Program

The Great Western Power Company recently has announced the quotas established for that company in its sales program from July 1, 1925, to Jan. 1, 1926. The company expects to sell 5,000 kitchen lighting units, 2,000 ranges, 1,000 water heaters and 2,000 air heaters during this period.

An adequate number of salesmen will be in the field to carry the plan to its completion. The details of its selling program is identical with that of the Pacific Gas and Electric Company as given on page 106 of this issue.

League Conference to Be Held Sept. 8-12.—At a meeting of the executive committee of the League Council, representing the association of local electrical leagues and clubs, held at Hot Springs, Va., June 5, it was decided that the League Conference would be held at Association Island, N. Y., Sept. 8-12. Attendance at the conference will be secured by invitations sent out by the Society for Electrical Development and the League Council.

New Domestic Refrigeration Rate Filed by Utah Utility

The Utah Power & Light Company has filed with the Public Utilities Commission of Utah a new rate schedule providing for a special domestic refrigeration rate for electric current. Heretofore domestic refrigeration has not been included in its rate schedules.

The new schedule virtually gives consumers the choice of three rates: 10, 5 or 3 cents per kw-hr. The 10-cent rate is the regular lighting rate, subject to 10 per cent discount for prompt payment. The 5-cent rate is the new special refrigeration rate, also subject to a prompt payment discount of 10 per cent. The 3-cent rate is the cooking rate, which has been in effect for some time in the company's territory.

A customer who receives only lighting service from the company may operate his electric refrigerator on the lighting rate through the same meter; or such customers may have a separate meter installed for current used in domestic refrigeration and pay for such current at the 5-cent rate. Customers who now have electric range service on the 3-cent cooking rate, also may operate a domestic electric refrigerator without an additional meter, paying the same rate for refrigeration as for cooking.

Where the special meter for refrigeration service is installed, the monthly minimum charge is $1.11 gross, subject to 10 per cent prompt payment discount.

Westinghouse Opens Engineering Division in San Francisco

An engineering division, to pass upon the engineering features of specifications and negotiations as well as to assist customers in their engineering work, has been established by the Westinghouse Electric & Manufacturing Company in its San Francisco office. The division will cover the complete field of engineering as far as the various products of the company are concerned.

A. W. Copley, for the past five years general engineer for the Pacific Coast territory of the company, has been named manager of the new division. Mr. Copley has been with the company for twenty-two years and during the last few years has been dealing particularly with hydroelectric developments. In addition to his duties as manager of the new division he will retain his position as general engineer for the San Francisco, Los Angeles and Denver offices.

The other members of the new division are F. L. Boissonnault, control engineer; P. B. Garrett, automatic control engineer, and P. B. Plass, motor engineer. These men have had several years experience with the company at its East Pittsburgh works.

Valuation Hearing Date Set on San Francisco Power Distribution Systems.—The California Railroad Commission has set the dates for the hearings on the application of the City and County of San Francisco to the commission to fix the condemnation valuation of the distributing systems of the Great Western Power Company and the Pacifiac Gas and Electric Company. The hearing relative to the former company will be held Sept. 7, 1925, and the latter Sept. 14.

Baker River Plant and Substation Nearing Completion

The Puget Sound Power & Light Company has announced that its substation at Beverly Park, near Everett, Wash., will be completed in September. It will be the largest outdoor substation in the Pacific Northwest, and will have an installation of seven 4,500-kva. transformers. Energy will be transmitted to the station from the company's Baker River plant at 110 kv., and will be stepped down to 55 kv. Two outgoing lines will connect the station with the Broadway substation in Everett. Energy will be transmitted to Seattle over the lines which recently were constructed between Everett and the Puget Sound city.

The completion of the Baker River plant, together with the company's substations at Sedro Woolley and Beverly Park in effect will make Everett a central point in a power system that will extend to British Columbia on the north, to the Columbia River on the south and eastward as far as Wenatchee.

It is stated by company officials that the Baker River plant will be in operation, and delivering some 40,000 hp. of energy within eighteen months from the date on which it was started, or during the month of September.

Contractor-Dealer Stores Badly Damaged by Earthquake

The accompanying pictures of shops and places where shops used to be show the losses which were sustained by contractor-dealers in Santa Barbara as the result of the recent earthquake. Picture No. 1 is the shop of the Nielson-Smith Electrical Company, the oldest established electrical house in the city. No. 2 is the location of the shop previously occupied by McGeary and Sons. No. 3 is the front of the store of the California Electric Company with a show case containing electric appliances on the sidewalk with the sign "Let's forget it and eat! Cook with electricity!" immediately above it. No. 4 is a snapshot of Fred Downer of Fred A. Downer and Company. No. 5 is another view of the location of the store of McGeary and Sons.

The letter from C. J. Geisbush, executive secretary of the Southern Division of the California Electragists, which is reprinted on page 78 of this issue contains some first hand information on the conditions existing in Santa Barbara and should be of interest to everyone.

Denver Electrical Cooperative League Holds Dinner Meet

Earl E. Whitehorne, member of the McGraw-Hill Company staff with headquarters in New York and vice-president of the National League Council, was the guest of honor and principal speaker at a dinner meeting of the Electrical Cooperative League in Denver, July 20.

Various phases of commercial activity, especially reflecting the atmosphere of the recent N.E.L.A. convention in San Francisco, were discussed. Mr. Whitehorne stopped in Denver while on his way East from the convention.

Although the hottest weather in recent years was being recorded in Denver, it is reported that there was a record attendance. It was the first meeting of the year under the direction of the new league administration headed by A. C. Cornell, as chairman. Ernest P. Kipp, W. R. Kaffer, K. L. Francis, Clarence Keeler and Robert Miller composed the committee on arrangements.

Expansion of Seattle's Skagit River Power Project Urged

J. D. Ross, superintendent of lighting, Seattle, in his annual report urges the expansion of the Skagit River hydroelectric power project to a point where the plant output would be 200,000 hp. He contends that the normal growth of the city light plant's business will warrant such expansion. He particularly emphasizes the need for the development of the Ruby Creek unit of the Skagit.

Mr. Ross states that a 200,000-hp. plant could be placed at Ruby Creek for $11,000,000 and could deliver power at the city limits for the cost of $55 per horsepower installed. His report states that this figure includes a railway from the present plant to Ruby Creek at a cost of $1,000,000, and an arch dam to be installed under the supervision of the federal government at a cost of $2,000,000. This dam would impound water for a plant of 175,000 hp. at Ruby, Mr. Ross states. He declares further that this storage still would make the Gorge unit reliable and yet permit the installation of the third 25,000-hp. generator in that plant, or even a 50,000-hp. generator if desired, as water will be available up to that amount.

Substation to Be Built in Seattle.— The Puget Sound Power & Light Company is to start immediately upon the erection of a $100,000 substation at 2203 East Pine Street, Seattle. The structure will be two stories high, 133 x 41 ft. in size, of reinforced concrete construction, faced with ornamental brick and trimmed with cast stone. The cost named will include the installation of electrical equipment.

Typical scenes of contractor-dealer stores in Santa Barbara after the recent earthquake.

Announce Preliminary Plans for Camp Cooperation V

The organization of the next conference of electrical leagues and clubs—Camp Cooperation V—to be held at Association Island, Henderson Harbor, N. Y., Sept. 8-12, inclusive, and sponsored by The Society for Electrical Development, is going ahead rapidly.

Among the subjects that will be included in the business program are the following: What Leagues are Doing; Planning the Business Program and Financing a League; Managing League Activities; The Social Side of the League; League Industrial Activities; Local Legislation and The Red Seal Plan. One of the interesting and important league sessions also will be devoted to women's work in the electrical industry.

Prior to the conference there will be a meeting of the board of directors of the Society, and during the conference week there will be special sessions of the league council; league secretaries and managers; advisory publicity council of the Society, and the electrical transportation group. The conference itself will close with a banquet at which there will be several speakers of national prominence.

Technical Section Meeting Dates Tentatively Selected

According to R. R. Cowles, chairman P.C.E.A. Technical Section, of the Pacific Gas and Electric Company, San Francisco, the tentative dates for the first of the technical conclaves will be Sept. 23-26. This series of meetings will be held in Los Angeles in accordance with the schedule previously decided upon by the executive committee. Detailed information further than this is not available at the present time, but will be announced later.

By placing the first conclave as stated above, a reasonable length of time after the close of the conclave will be available for those who are to go to the first of the national technical gatherings to prepare for the trip. According to the present plans of the Technical National Section, this first inter-divisional conclave will be held in Detroit, Oct. 6-9. The second conference is scheduled for Kansas City, Feb. 9-12, 1926. A meeting of all geographical Technical Section chairmen will be held in Chicago Aug. 5, the place to be announced later.

Associations File Petitions for Special Ornamental Lighting Posts.—Wilshire Boulevard Association and West Wilshire Improvement Association of Los Angeles, Calif., have filed with the city council's traffic and lighting committee petitions for the installation of ornamental lighting posts of a copyrighted design for Wilshire Boulevard from Westlake Park to Fairfax Avenue. The posts selected are to be copper plated cast iron 26 ft. in height and are to be for exclusive use on Wilshire Boulevard.

Gorge Creek Tunnel Suit to Be Tried in Fall.—The case of Storrie & Company against R. M. Grant & Company (Journal of Electricity, June 15, 1925, p. 597), involving the sale of Seattle's Skagit power project bonds, has been placed on the calendar of the federal court in San Francisco. The trial is expected to start early in the fall.

P. C. E. A. Technical Section Executive Committee Makes Report

A red-letter year for the Technical Section, P.C.E.A., has just drawn to a close. Increased efficiency in organization, better service and assistance to member companies, better attendance at meetings, greater cooperation with the Technical National Section, and broader contact and a wider horizon of vision for members may be credited to the conscientious hard work put in by the retiring chairman, P. O. Crawford, and his staff. A report and comment upon the past year's activities and those projected for the ensuing year as submitted by Mr. Crawford are as follows:

"The executive committee of the Technical Section is grateful to member companies, officers of the association, and section members for their hearty support of the work during the association year just completed. This support helped the section to do its bit toward developing the art, reducing costs, and improving its organization.

"The work and schedule of conclaves for the year were planned at an executive committee meeting held in San Francisco in August. At the September conclave in Los Angeles the bureaus were organized and definite studies decided upon. The second conclave held in San Francisco in January saw good progress in the year's activities which were brought to a final conclusion at the March conclave held in Fresno. This latter was of vital importance in that it took the place of the usual convention. The large attendance, of from 100 to 145, at these conclaves gave an excellent opportunity for personal contact and interchange of ideas, and resulted in lively bureau meetings. The members were given a comprehensive picture of all section activities at luncheon meetings addressed by the bureau chairmen. Supplementing the routine work, the members were addressed at the general meetings on subjects of interest to the section by men prominent in the industry. The speakers at the Los Angeles meeting were H. A. Barre and Harris J. Ryan; at San Francisco, F. A. Leach, Jr., Waldo Coleman, John D. McKee, S. J. Lisberger, and C. T. Hutchinson; at Fresno, A. Emory Wishon and A. G. Wishon.

"To avoid interrupting the work at the end of the year and to improve efficiency generally, the executive committee modified the section organization so that each committee chairman would be assisted by a vice-chairman. This vice-chairman will become chairman the following year. It further was decided to have the studies for the ensuing year determined by the retiring committee at its last meeting. Through these changes it will be possible either to reduce the number of meetings per year or to increase the quantity of work handled. The use of the name "bureau" for the divisions of the section was abandoned in favor of "committee," which conforms with the Technical National Section nomenclature.

"All the work of this section tends toward greater efficiency and reduced costs in the technical phases of the industry. However, some of the outstanding feature of this year's work have a direct bearing on reduction in investment and operating costs. As submitted to the technical national chairman, these subjects are as follows:

"Education of Metermen" will tend toward increased efficiency.

"Relay Calibration" will result in improved reliability.

"Study of Low First Cost Methods of High Tension Metering."

"Study of Meters" to prevent loss of revenue through over-metering.

"Study of Oil Circuit Breakers" already installed for purpose of increasing their rupturing capacity.

"Study of Oil" in an effort to select one that will serve for all oil-immersed apparatus.

"Study of Relays and Relay Application" to prevent loss of revenue due to unnecessary interruptions and damage to equipment.

"Fire-Fighting Equipment" for protection of electrical apparatus.

"Hydroelectric Plant Layout" gives industry benefit of best practice in selection and arrangement of plant equipment.

"Analysis of Plant Outage Due to Hydraulic Troubles."

"Studies of Fuel Oil Burning and Condenser Troubles" will affect improved steam plant economies.

"Study of Duct-Line Temperature and High-Voltage Cable," both of which will permit more efficient use of underground cables and ultimately will lead to higher voltage and greater capacities.

"Revision of General Order No. 64." If accepted by the California Railroad Commission, will mean saving through reduction in pole height and simplification of construction.

"Studies by Pole Committee" will tend to economy in steel poles through standardization and savings in wood poles through data on strengths and treatments.

"Transformer Standardization" will mean lower erection costs and reduced stocks.

"Testing Insulators in Service" and "Hot Line Maintenance" will mean reduced operating costs.

"Mr. N. W. Cummings, of the California Institute of Technology, at Pasadena, Calif., making an investigation of the evaporation losses from reservoirs asked the association for assistance in this work. After a thorough investigation by the hydraulic power bureau it was decided that $400 be contributed to this research for the purpose of instruments. The results of this investigation should be available for publication with the section report for 1926.

"The technical section of the P.C.E.A. has received favorable comment from the officers of the Technical National Section because of its large representation at the eastern meetings, and the work accomplished in connection with the national program of co-ordinating the activities of the national and geographic divisions. Following the established custom of sending its officers as delegates to the eastern meetings, Messrs. Peabody, Steinbeck, Corbett, Talbott, and Gaylord were sent to St. Louis; and Messrs. Cowles, Searle, Porter, Jenkins, Schnell, and Crawford to Cleveland. This contact is of advantage to the section not only in technical matters but will mean a broader administration of section affairs and greater benefits for member companies.

"The committee is indebted greatly to the president and the secretary of the association for their kind assistance, and also to the Journal of Electricity for the manner in which was handled the publicity in connection with the section work of this year.

"Much credit is due the bureau chairmen for their conscientious and untiring effort in carrying out the year's program. In addition to this they have collected a large amount of data for the national section.

"A summary of the report of each bureau chairman covering the past year's work and that projected for the coming year is given in the following tabulation:

SUBJECTS FOR STUDY

Accident Prevention—J. M. Buswell, Chairman

1924-5	1925-6
First Aid Training.	Accident Statistics.
Code of Safety Rules and Safe Practices.	Best Form of Safety Code.
Company Organizations for Accident Prevention.	Best Form of Organization.
Accident Prevention Course for Linemen.	Accident Prevention Courses.
Safe Practices.	Interchange of Important Safe Practices.
Safe Tools and Devices.	Safe Tools and Devices.
Safety Bulletins.	Distribution of Safety Bulletins.

Inductive Interference—L. J. Corbett, Chairman

Routine Telephone Co-ordination Problems.	Routine Telephone Co-ordination Problems.
Cooperation with national committees in gathering data on existing parallels.	Cooperation with national committees in gathering data on existing parallels.
Radio Interference.	Radio Interference:
	1. Equipment and Methods Used in Detection.
	2. Educational Publicity.
	3. Classification of Radio Troubles in cooperation with the national committee.

Underground Systems—C. H. Jenkins, Chairman

Cable Splicing.	Cable Terminals, Pot-heads.
Duct-Line Temperature.	Kenetron Testing.
Manhole and Conduit Construction.	Preventing Deterioration of Metal Service Pipe.
High-Voltage Cables—35 kv. or higher.	Sheath Currents.
	Cement Conduit.
	Junction Boxes—Reduction in Wall Space.

Hydraulic Power—R. M. Peabody, Chairman

*Hydroelectric Plant Layout	The Effect of Speed Regulation and Water Hammer on the Design of Pressure Relief Valves, Penstocks and Surge Chambers.
Discharge Coefficients Through Large Rectangular Openings.	Mechanical Reliability of Hydroelectric Units.
Investigation of Silt Deposits in Canals, Flumes and Settling Basins.	Investigation of Silt Deposits in Conduits.
*Mechanical Reliability of Hydroelectric Units.	Obstruction in Flow Due to Vegetable Growth in Conduits.
Hydraulic Turbines.	Painting of Penstocks.
	Specifications for Welded and Seamless Pipes.
	Evaporation and Percolation in Storage Reservoirs.
	Expansion Joints in Penstocks.

Overhead Systems—E. Y. Porter, Chairman.

*Revision of Overhead Handbook.	Testing High-Voltage Insulators in Service.
Line Construction Costs.	Maintenance of High-Voltage Lines.
Testing High-Voltage Insulators in Service.	Distribution Transformer Standardization.
Distribution Transformer Standardization.	Bare Wire for Distribution.
*Steel Poles.	
Revision of General Order 64 in Cooperation with Advisory Committee.	

Apparatus—C. E. Schnell, Chairman.

Relays and Relay Application.	Relays and Relay Application.
Fire-Fighting Equipment.	Pacific Coast Practices in Transmission and Distribution Substations.
Oil Circuit Breakers.	Additional Information on Station Grounds.
Transformers.	Oil Circuit Breakers.
Station Electrical Grounds and Control of Grounds.	Joint Review of Transformer Voltages.
Power Interchange.	Lightning Arresters.
Automatic Generating Plants and Automatic Substations.	Carrier-Current Telephone Communication.
Frequency Changers.	High-tension Fuses.
Transformer Voltage Control.	
*Power Plant Layout.	

Meter—G. H. Searle, Chairman.

Education of Metermen.	Proper Size Meters for Various Installations.
Meter Test Period.	High-Tension Metering for Operating Purposes.
Maintenance of Relays.	Meter Test Period.
Effect of Wave Shape on Operation.	Keep in Touch with Safety Rules Committee.
High-Tension Metering for Operating Purposes.	Education of Metermen.
Use of Oil in Meter Bearings.	Maintenance of Relays.
Cooperation with Safety Rules Committee.	New Developments.
Proper Size Meters for Various Installations.	
New Developments:	
Improvements in Watthour Meters.	
Low-Cost High-Tension Current Transformer.	
New G. E. Demand Contact Device.	
Westinghouse O. B. Meter.	
Synchronous Motors for Demand Meters.	
Multi-Range Standard Instrument Transformers.	

Prime Movers—C. E. Steinbeck, Chairman.

*Cooling Towers.	*Burning of Liquid and Gaseous Fuels.
*Operating Code Definitions.	Stand-by Plant Design.
Heat Balance—Long Beach Steam Plant.	Cooling Towers—Spray Ponds.
Boilers.	Condenser Leakage.
Refractories.	Station Auxiliaries—Modern Plants.
	Heat Balance.

Safety Rules—W. H. Talbott, Chairman.

Contact with the California State Safety Orders.	Study of Safety Orders and their Application.
Method of Installing Water Heaters and Cost of Installation, as Applied to the Code Requirements.	Changes in the National Electric Safety Code.
	Study of Safety Switches.
	Grounding Problems and Requirements on Consumers' Installations.

* National Technical Section subjects.

Book Reviews

CONNECTING INDUCTION MOTORS

By A. M. DUDLEY. B. S. in Electrical Engineering (Michigan); Fellow, A.I.E.E.; Member Society of Automotive Engineers; Manager, Automotive Engineering Department, Westinghouse Electric & Manufacturing Company. Second Editon, 6 x 9 in., 361 pages, 289 figures. $3. Published by McGraw-Hill Book Company, Inc., New York, N. Y.

Up to a comparatively few years ago the subject of induction motors had been treated almost wholly from the theoretical standpoint. The windings of this type of motor, as well as the practical details of construction, had very little published concerning them. A practical treatise such as this book on the winding characteristics of this important piece of electrical apparatus is most valuable.

In the second edition five new chapters have been added, and a few alterations have been made to the first edition. No radical changes have been made, however, as the author feels that the experience with the first edition indicates that the treatment is satisfactory for the purpose intended—to serve the practical man engaged in operating and repair work.

The book opens with chapters on the rotating magnetic field and types of windings, followed by chapters on rotor and single phase windings. Chorded windings, distribution factor, and the effect of changes in voltage, in the number of phases, in the frequency, and in the number of poles then are treated. Chapters follow on unusual or emergency conditions, reconnecting old windings for new conditions, and locating faults in induction motor windings. One of the most valuable chapters in the book then follows, covering methods of figuring a new winding for an old core. The important features of design are pointed out very clearly from a practical standpoint in the chapter. Methods of connecting to correct magnetic side pulls then are treated, and the book concludes with three chapters covering various winding diagrams.

The reputation of this book leaves little to be desired in describing its value as a book for repair men and operating men whose work has to do with induction motors. The various problems of winding and repairing of this important piece of electrical machinery are handled very thoroughly in the book, and no doubt it will be much in demand among men whose duties include the supervision of induction motors. E. R.S.

California Electrical Bureau Issues New Edition of Appliance Information Booklet.—A new edition of the "Hand Book of Electrical Appliance Information" has been issued by the California Electrical Bureau. This edition is the same as the previous one (Journal of Electricity, July 15, 1925, p. 69), with the exception of the insertion of a table of operating costs that lists each appliance and gives the average cost per hour to operate it.

Meetings

Plans Under Way for Glenwood Springs Joint Convention

There are only four days in September, according to the calendar recently issued by the publicity committee promoting the annual joint convention of the Rocky Mountain Division, N.E.L.A., and the Colorado Public Service Association at Glenwood Springs. The four days specified are all in red ink and indicate that September will have the 14, 15, 16 and 17. These are the convention dates, and over 500 invitations and broadsides have been issued by the committee as the first gun in promoting a record attendance at the convention.

O. A. Weller, chairman of the program committee, reports a ready acceptance from speakers. The entertainment committee headed by John J. Cooper already has the social side under way while Ned Phinney, general convention chairman, is rounding the general plans into shape.

Members of the electrical and utility industry and ladies are invited to attend, according to Mr. Weller, who is secretary of both of the sponsoring organizations.

Civil Engineers Hold Summer Meeting at Salt Lake City

Although irrigation and land settlement were the chief subjects considered, some important engineering phases of power development were discussed at the summer meeting of the American Society of Civil Engineers held at Salt Lake City July 8-10. William Kelly, director of engineering, National Electric Light Association, and former chief engineer of the Federal Power Commission, in a paper entitled "Cooperation in Irrigation and Power Development" discussed the regulation of stream flow on some of the principal Western rivers to meet the demands of irrigationists and power interests.

He reviewed specific cases which have been brought to the attention of the Federal Power Commission, pointing out the difficulties which have been involved and the solutions which have been reached. Among the examples which he cited were the Deschutes River in Oregon, the Columbia, Sacramento, San Joaquin, Kings, Green, Trinity, and American Rivers. All of the cases he mentioned have been reported in the proceedings of the commission or have been the subject of special investigations and reports.

"Interstate Water Problems and Their Solution" was the subject of two papers, one presented by M. C. Hinderlider, state engineer, Colorado, and the other by Frank C. Emerson, state engineer, Wyoming. Mr. Hinderlider presented the side of the question favoring the Colorado River Compact plan and reviewed the history of the Compact idea and offered much data on recent interstate decisions and interstate legislation.

Mr. Emerson disagreed with this view, urging that interstate water rights should be settled by conference. He urged that every effort be made to avoid methods of settlement of interstate questions that may call for litigation or adjudication.

The principal paper before the Power Division dealt with "The Relation of Stream Regulation to Irrigation and Power Development" and was presented by J. C. Stevens, consulting hydraulic engineer, Portland. In this paper and in the discussion which followed, it was held that in the arid West the irrigator should have first claim to the water supply in preference to power. It was brought out that power will benefit in the long run by conceding to such preferential use. Complete regulation of the water supply of the arid West for irrigation will require the storage of 40 per cent of the annual low water yield, the paper set forth. Were the water supply so regulated, Mr. Stevens pointed out, power use could be made of about 60 per cent of that supply without interfering with irrigation. Water is indispensable for irrigation but not for power, he stated. The development of waters not available for irrigation and the interconnection of power systems will tend to minimize the irrigator's demands upon water used for power development.

COMING EVENTS

California Electragists, Northern Division—
Annual Convention—Eureka Inn, Eureka
Aug. 6-8, 1925

Pacific Radio Exposition—
Third Annual—San Francisco, Calif.
Aug. 22-28, 1925

National Radio Exhibition—
Third Annual—Los Angeles, Calif.
Sept. 5-12, 1925

Camp Cooperation V—
Conference of representatives of local electrical leagues—Association Island Henderson Harbor, N. Y.
Sept. 8-12, 1925

Rocky Mountain Geographic Division, N.E.L.A.—
Annual Meeting—Glenwood Springs, Colo.
Sept. 14-17, 1925

American Institute of Electrical Engineers—
Pacific Coast Convention—Seattle, Wash.
Sept. 15-17, 1925

Eureka Meeting of Electragists to Be Attended by Many

So many reservations have been received for the annual convention of the Northern Division of the California Electragists to be held in Eureka Aug. 6-8 that it will be impossible to accommodate all those planning to attend at the Eureka Inn. The overflow will be taken care of at the Hotel Vance. The committee in charge of the convention has been very gratified by the cooperation they have received from men who have given up their reservations at the Eureka Inn and will go to the Hotel Vance so that all women attending the convention may be housed at the Inn.

The program which has been arranged includes the executive committee meeting Thursday morning and the general open meeting Thursday afternoon, while an auto tour up the coast has been arranged for the ladies during this time. Friday will be spent in the logging woods and the electric mills and an informal ball will be held Friday night.

Power Companies' Sales Program Explained At Joint Meeting

The sales program of the Pacific Gas and Electric Company and the Great Western Power Company, including details regarding the kitchen lighting, range, water heater, and air heater campaigns of both companies, was the subject discussed at a joint meeting of the Tri-County Electrical Development League, the Marin County Electrical Development League and the Sonoma County Electrical Development League that was held recently at Fetters Springs in Sonoma County. Earl Wilson of the Tri-County League presided over the meeting. Greetings from the other leagues were extended by T. W. West, vice-president of the Marin County League, and Tully N. Cornick, president of the Sonoma League.

Capt. G. B. Baldwin, of the Pacific Gas and Electric Company, spoke on the value of organization and stated that cooperation is successful if based on the cornerstone of confidence. He said the sales program of the two public utilities would take care of the two greatest obstacles facing contractor-dealers, namely, lack of capital to finance time payments, and costs for range installations, both without loss to the contractors.

E. F. Perkins explained the kitchen lighting campaign of the Pacific Gas and Electric Company and its lamp sales campaign. He also explained the details of the range, water heater, and air heater campaign of both companies.

R. T. Stephens, electric sales manager of the Pacific Gas and Electric Company, summed up the highlights of the sales program, presenting figures which gave some idea of the immensity of the value of the merchandise and wiring involved. He stated that the company salesmen would receive their commission, regardless of whether the sales were made through a contractor or dealer, and that they gladly would work with the contractor and dealer in making sales.

J. W. Wrenn, range sales manager of the Great Western Power Company, stated that the range, water heater and air heater sales program of his company was identical with that of the Pacific Gas and Electric Company. He urged every one in the industry to equip his own home electrically and stated that was one of the strongest arguments which could be presented by any salesman.

Questions of those present were discussed by the speakers, following the presentation of the details. The meeting was attended by approximately seventy-five.

Red Seal Plan and Power Sales Program Explained to League

At a recent meeting of the Contra Costa County Electrical Development League at Martinez, Calif., Clyde L. Chamblin of San Francisco, a member of the Board of Directors of the Society for Electrical Development, explained the Red Seal Plan of adequate wiring as it will be executed by the California Electrical Bureau and the California Electragists.

The sales program of the Pacific Gas and Electric Company and the Great Western Power Company also was explained in detail by representatives of these companies.

Personals

John B. Miller, president of the Southern California Edison Company, and chairman of the board, with headquarters in Los Angeles, has added to his numerous duties the additional ones of a vice-president of the National Electric Light Association, a position to which he was elected at that organiza-

JOHN B. MILLER

tion's recent convention in San Francisco. Born in Port Huron, Mich., in 1869, and educated at Ann Arbor High School and the University of Michigan, Mr. Miller went to California in 1896. Five years later when the West Side Lighting Company and the Redlands Electric Light & Power Company were merged to form the Edison Electric Company, he became president of the organization. In 1909 the company was reincorporated as the Southern California Edison Company, and Mr. Miller was elected president; nine years after he was made chairman of the board. Under his leadership the company has shown a steady and substantial growth and has taken its place in the front ranks of the utilities of the West. Mr. Miller always has taken a prominent part in the activities of the electrical industry; in particular he served with distinction as chairman of the convention committee of the N.E.L.A. in 1920. Outside of his electrical interests, he has numerous affiliations in the commercial field and is an officer and director in many large companies.

Frank J. Kiefer, formerly field representative of the California Electrical Bureau, recently has become factory superintendent for the White Pine Products Company of Alameda, Calif.

L. E. Belford, representative of Fairbanks-Morse & Company, in the Escondido and San Diego inland districts, now includes Arizona in his itinerary.

C. B. Hawley, president of the Rocky Mountain Electric Cooperative League, Salt Lake City, returned recently from the East where he attended several conventions.

S. B. Gregory, Western manager of the Arrow Electric Company, Hartford, Conn., recently left San Francisco to visit the Hartford office of his concern.

H. A. Rands, formerly construction engineer for the Portland Electric Power Company, Portland, Ore., recently accepted an engineering position with the Hammon Consolidated Gold Fields, Nome, Alaska.

E. A. Scott of Scott Bros. Electric Company and Dean D. Clark of the Mountain States Telephone & Telegraph Company recently were re-elected secretary and treasurer, respectively, of the Electrical Cooperative League of Denver.

E. E. Hill, superintendent electric meter department, New York Edison Company, stopped in San Diego for a chat with W. H. Talbott on his way to the N.E.L.A. convention.

R. H. Blanken, vice-president, Airfan Radio Corporation, recently described to the San Diego Electric Club the plans now being carried out to erect a 500-watt radio broadcasting station in that city on the roof of a leading hotel. The new station, to be known as KFVW, is to go on the air, Mr. Blanken stated, about Oct. 1.

A. H. Meyer has been appointed general manager of sales for Leo J. Meyberg Company, with headquarters in Los Angeles; **J. W. Thompson** has been made sales manager for northern California and **L. J. Tappan** assistant sales manager, both with headquarters in San Francisco. These changes were made following the recent death of Sheldon N. Petersen.

R. V. Jones, formerly director of sales of the Hoover Company, Canton, Ohio, has been appointed director of sales for the Hydro-Electric Manufacturing Company, Milwaukee, Wis.

L. W. Ross, transmission engineer Pacific Telephone & Telegraph Company, Portland, Ore., and chairman of the local section of the American Institute of Electrical Engineers, recently returned from the East where he attended the convention of the A.I.E.E. at Saratoga Springs, N. Y.

S. Z. Mitchell, president of the Electric Bond & Share Company, New York, was a visitor in Salt Lake City recently. Mr. Mitchell had just completed an inspection trip over the Idaho property of the Utah Power & Light Company, and was on his way to his New York offices after attending the N.E.L.A. convention in San Francisco.

R. P. Waite, formerly with the Southern California Edison Company, Los Angeles, is now electrical engineer in charge of design for the Texas Power & Light Company, with headquarters at Dallas.

Thomas Hunt, Tacoma, Wash., has been awarded a scholarship in electrical engineering by the Westinghouse Electric & Manufacturing Company. He will go to Pittsburgh to take up work in the Westinghouse school of electrical engineering.

M. Sweyd, Pacific Coast agent for the Lionel Corporation of New York, has moved his offices to 788 Mission Street, San Francisco.

Clark H. Minor, formerly vice-president of the International General Electric Company, has been elected president of the company, succeeding Anson W. Burchard, who will continue as chairman of the board. **Loren Emery,** former assistant merchandising manager of the company, has been made general merchandising manager. **R. G. Henderson,** former manager, has been detailed for special promotion work.

F. O. Sievers, for sixteen years with the industrial sales department of the General Electric Company, San Francisco, has severed his connection with that organization and is now vice-president and manager of the Coney & Kuchel Electric Works of that city. The firm will specialize in industrial plant work.

H. D. Fearey has been placed in charge of the Portland, Ore. territory of the Square D Company, Detroit, Mich., succeeding **H. R. Drew,** who has resigned his position with that company.

M. Luckiesh, director, Lighting Research Laboratory, National Lamp Works of General Electric Company, Cleveland, recently has been elected president of the Illuminating Engineering Society.

F. G. Fullman, sales manager, Steel City Electric Company, Pittsburgh, Pa., has resigned his position. **J. R. Richards,** recently connected with the credit department, succeeds Mr. Fullman.

A. C. Cornell, manager of the Western Electric Company in Denver, has been elected chairman of the Electrical Cooperative League of that city for the coming year. He is well known in electrical and utility circles of the Rocky Mountain region and is one of the founders of the Denver league. Mr. Cornell is a native of Rochester, N. Y., but he received his elementary education in the New York City Schools and later attended New York University and Washington University in St. Louis, Mo. It was in the latter city that he joined the Western Electric Company, with which he will have been associated twenty years next October. He was transferred to Denver as sales manager of the company in August, 1917, and on July 1, 1921, he was named manager of the Rocky Mountain district. He has served as treasurer of the Rocky Mountain division, N.E.L.A., for a number of years and has been a member

A. C. CORNELL

of the Rocky Mountain Committee on Public Utility Information since its formation in 1922. He is a member of the A.I.E.E. and the Society for Electrical Development and of various clubs in Denver, including the Rotary, Denver Athletic Club, Lakewood Country Club, Mt. Vernon Country Club, Denver Motor Club, Denver Press Club, and he is vice-president of the Park Hill Heights Improvement Association. Mr. Cornell has been a representative of the jobbers' division on the advisory board of the Electrical Cooperative League since its organization in 1921.

F. B. Schuyler and **J. F. Russell,** president and production manager, respectively, of the Johnson Washer Company, Oakland, Calif., have returned recently from an extended trip East where they visited a number of factories.

W. H. Hodges, manager of advertising and publicity, and **B. F. Braheney,** general auditor, Byllesby Engineering & Management Corporation, and **W. N. Clarke,** general manager, Southern Colorado Power Company, Pueblo, Colo., were among the Byllesby visitors to San Diego following the N.E.L.A. convention.

H. F. Hartzell, of Maydwell & Hartzell, San Francisco, returned a short while ago from a two and a half months' trip to the East where he visited a number of factories and investigated business conditions.

J. E. Davidson, vice-president and general manager of the Nebraska Power Company, Omaha, who was elected president of the National Electric Light Association at its recent convention in San Francisco, is a veteran of the electrical industry. The son of Wilbur F. Davidson, one of the pioneers in the field, Mr. Davidson has been acquainted with power stations since he was ten years old. Beginning his career as oil wiper, coal heaver and meter reader at the power plant of Port Huron, Mich., he was made superintendent of the plant at the age of twenty. Six years later he became general manager of the Consolidated Lighting Company, Montpelier, Vt. In 1910 he went to Portland, Ore., to take the general managership of the Pacific Power & Light Company, becoming vice-president and general manager two years later. He left Portland in 1917 for Omaha to assume the duties of his present position. Mr. Davidson always has taken a keen interest in the affairs of the electrical industry and has served

J. E. DAVIDSON

as president of the Vermont Electrical Association, of the New England section of the N.E.L.A., and of the Northwest Electric Light and Power Association. As chairman of the Lighting Educational Committee of the N.E.L.A. he sponsored and directed the International Better Home Lighting Campaign and essay contest last year. In addition to his activities in the electrical field, Mr. Davidson finds time to be a director of the Chicago Great Western Railroad, the Live Stock National Bank, and the University of Omaha. He was born in Flint, Mich., in 1879.

D. L. Huntington, president, The Washington Water Power Company, Spokane, recently returned from the East.

Ray W. Turnbull, assistant Pacific Coast sales manager, Edison Electric Appliance Company, Portland, spent a few days in Spokane recently on general sales matters.

H. D. McKinney, manager of the Chicago sales office of the Driver-Harris Company of Harrison, N. J., has been elected second vice-president and general sales manager of that company.

J. H. Cunningham, of the Los Angeles division of the General Electric Company, at a recent meeting of the San Diego Electric Club described the features of the new Long Beach steam plant of the Southern California Edison Company.

George Rucker of the Holophane Company, San Francisco, was a visitor to San Diego recently, in connection with the street lighting installations being made there.

J. H. Briggs, of the bond department of H. M. Byllesby & Company, was a visitor to the Coast properties of the company recently.

W. S. Mason has been placed in charge of the new branch office of the Pacific States Electric Company in Phoenix, Ariz. Mr. Mason formerly covered the territory in and around Los Angeles.

Fred E. Staible, Jr., formerly head of the Wesco Supply Company, manufacturers' agent in Denver, has resigned to organize his own firm of Fred E. Staible, Inc., with headquarters and warehouse at 2356 Blake Street in that city.

L. S. Storrs, managing director of the American Electric Railway Association, was a visitor in Salt Lake City July 21 and 22. Mr. Storrs was the guest of local electric railway officials at a luncheon at the Alta Club on July 21 and spoke before the business men of Salt Lake City at the Chamber of Commerce at a luncheon July 22. He departed for California on July 22, with the intention of inspecting various urban and interurban systems in that state.

L. C. Williams, formerly of the Los Angeles Bureau of Power and Light, has been made manager of the newly opened district office of the Pacific Electric Manufacturing Company in that city.

E. A. White, Chicago, a member of the National Committee on the Relation of Electricity to Agriculture, has been making a trip along the Pacific Coast conferring with state committees connected with this work.

W. S. Greenfield, president, Allied Industries, Inc., San Francisco, attended the Rotary Club convention recently held in Cleveland, and also visited various important Eastern centers on matters of business in connection with his company.

R. A. Thompson, consulting engineer, formerly chief engineer Railroad Commissions of Texas and California and member engineering board, Interstate Commerce Commission, and **H. G. Butler,** consulting engineer, formerly assistant chief engineer Railroad Commission of California and power administrator for the State of California, have formed a partnership for the general practice of engineering, with offices at 216 Pine Street, San Francisco.

C. W. Koiner, city manager of Pasadena, Calif., has resigned that position effective July 1. After a short vacation he intends to establish offices in Los Angeles as a consulting electrical engineer. Mr. Koiner has been connected intimately with the electric light and power business since 1892, when he began work for The Laurel Electric Light, Power & Heat Company of Laurel, Md. In 1905 he went to St. Louis, Mo., as secretary-treasurer and engineer of the National Light & Improvement Company, a holding company controlling a number of gas and electric utilities throughout Kansas and Texas. Moving

C. W. KOINER

to California in 1908, Mr. Koiner became general manager and electrical engineer of the city of Pasadena's light and power department. His appointment in 1921 as first city manager of Pasadena was the logical culmination of his excellent record in the city's service.

D. D. Swauger, connected with the San Francisco office of the Edison Storage Battery Company for the past several years, has been transferred to the Los Angeles office of that company.

Maj. G. E. Edgerton, chief engineer of the Federal Power Commission, recently visited Utah where he made extensive hydroelectric investigations in the interests of the commission.

Obituary

Roy Edward Shawlin, for the past six years affiliated with the Russell & Stoll Company, New York, died on June 26 at the age of forty. Starting as manager of the Chicago office, Mr. Shawlin served for two years in that capacity before removing to New York as sales manager, the position he occupied at the time of his death. Formerly, Mr. Shawlin was identified with the Westinghouse Lamp Company, with the business staff of the Electrical World and just previous to his connection with Russell & Stoll with the Franklin Lamp Company. He was a native of Ottawa, Ill.

John H. McIntosh, manager, Federated Industries of Washington, Seattle, recently died suddenly in that city.

TRADE NOTES

Adams Bros. Manufacturing Company, Inc., Pittsburgh, Pa., manufacturers of radiant gas heaters, announce the placing on the market of a white percelain enamel electric wall heater especially designed for use in bathrooms. Construction is rugged and the heating element well protected and supported. The heaters are made for 110-120 volts.

The Birtman Electric Company, Chicago, makers of Bee-Vac cleaners, is offering a trip to Chicago with a week's entertainment to the Bee-Vac jobber's salesman making the most sales between June 1 and Aug. 1.

Marchant Calculating Machine Company, Oakland, Calif., recently has placed a new electrically driven automatic calculating machine on the market which, it is stated, effects a method of "short cut" that gives results in true figures, speeds up work and greatly reduces the amount of replacement and maintenance costs.

Mac Products Company, Erie, Pa., has introduced recently a new type of oscillating washing machine designed to eliminate complicated construction and to produce speed and efficiency in operation.

U. S. Electrical Manufacturing Company, Los Angeles, has developed recently the U. S. Auto-Start motor, which it is stated is an automatic self-starting squirrel-cage motor without any moving parts in the starting mechanism.

Circle F Manufacturing Company, Trenton, N. J., has announced the issuance of a new net price sheet, giving a detailed list of its products with prices and descriptions.

General Electric Company, Schenectady, N. Y., has issued recently a twelve-page descriptive bulletin entitled "The Voltage Drop Control System." The bulletin is well illustrated with photographs.

The Electrical Equipment & Manufacturing Company, Toledo, Ohio, has purchased recently the patent rights, dies and other equipment from the Michigan Stamping Company of Detroit, which formerly manufactured the Wolverine and B. G. line of outlet boxes, switch boxes and cabinets, and which featured the patented B. G. stud for use in outlet boxes. In addition to this the Electrical Equipment Company also has purchased the entire production for the next twelve months from the End-O-Let Company of Detroit, manufacturers of End-O-Lets, and has entered into a contract with that company to accept the selling agency on its fittings.

P. A. Geier Company, Cleveland, has announced its new Super-Royal Cleaner, Model "K," for which many advantages are claimed. Descriptive literature may be had by writing the company.

Russell Electric Company, Chicago, Ill., recently has placed three new lines of merchandise on the market, the Hold-Heet De Luxe curling iron, the Hold-Heet De Luxe combination hair dryer and curling iron and the Hold-Heet De Luxe heating pad.

The Esterline-Angus Company, Indianapolis, Ind., has issued recently Bulletin 425, featuring the new Esterline-Angus "Twin Type" graphic meter, in which it is claimed any two standard meter elements can be built, and either strip charts or daily charts can be used. It is said to occupy 30 per cent less switchboard space and gives two records accurately synchronized as to time.

Circle F Manufacturing Company, Trenton, N. J., has issued recently descriptive literature of a new product called the "Circle F shallow type switches." The merits of this new device are given fully in the booklet. In addition to this the company announces the manufacture of the new "Circle F" canopy switches, which are designed for use with shallow spun or cast canopies.

Crescent Washing Machine Company, New Rochelle, N. Y., has issued recently a new catalog describing its Crescent dishwashing machines. The booklet is illustrated profusely with photographs and drawings.

Chicago Fuse Manufacturing Company, New York, has announced the removal of its office and warehouse to 71 Murray Street, that city, where it will be better equipped to give service to its customers.

The Magnavox Company, Oakland, Calif., has announced the appointment of Munson-Rayner Corporation as exclusive distributors of Magnavox radio products for the Pacific Coast states, with offices at 86 Third Street, San Francisco, and 643 South Olive Street, Los Angeles.

Fulton Iron Works Company, St. Louis, Mo., has issued recently a bulletin of its Type "J" Fulton-Diesel engine. The bulletin is illustrated and contains a list of stations where these engines are installed.

Sangamo Electric Company, Springfield, Ill., has issued recently Bulletin No. 69 on Sangamo distant dials, which are used with watt-hour meters for duplicating at a convenient location the reading of the meter register, for totalizing the revolutions or strokes of engines, generators, or other machines, or for summing on a single dial the total registration of a group of watt-hour meters. The distant dials are made in two types for operation on direct and alternating current.

General Electric Company, Schenectady, N. Y., has issued recently a new 27-page, paper-bound bulletin, No. 41,521-B, which is well illustrated and presents a complete line of motors, alternators and frequency changers adaptable for application on modern high-speed wood-working machines and those forms of machine tools requiring high-speed drive.

Link-Belt Company, Chicago, Indianapolis and Philadelphia, has placed in operation recently a new plan by which complete lines of silent chain drives of from one-quarter to ten horsepower, in practically any reduction from one to one to seven to one, are now available for immediate delivery, thereby eliminating delay and avoiding the made-to-order basis formerly employed.

Roller-Smith Company, New York, has issued recently two new bulletins covering its lines of apparatus. Bulletin No. 400 is descriptive of its direct-current switchboard instruments, including ammeters, milli-ammeters, voltmeters, milli-voltmeters and volt- ammeters. Bulletin No. 530 describes the new non-closable-on-overload circuit breaker.

Benjamin Electric Manufacturing Company, Chicago, Ill., has issued a new pamphlet describing its "Benco" weather-proof socket for heavy duty industrial use.

Fairbanks, Morse & Company, Chicago, has issued recently Bulletin H306, profusely illustrated and fully descriptive of its motors on metal-working machines.

The Magnavox Company, Oakland, Calif., recently has issued several new pamphlets descriptive of its portable electric heaters.

Who wouldn't envy this group? Reading from left to right they are: Harry Walker, vice-president, California Electragists; Glen E. Arbogast, Newbery Electric Corporation; Harry Harper, Western Electric Company, all from Los Angeles.